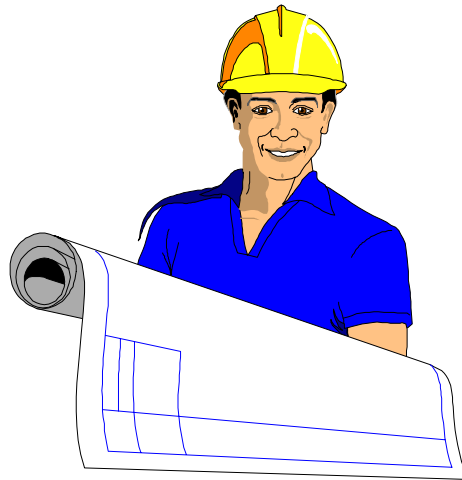


An Analysis Of Work Control

... An ISMS Perspective



*I*ntegrated
*S*afety
*M*anagement ... at the Activity Level

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PURPOSE

The Department of Energy's (DOE) Integrated Safety Management System (ISMS) is being implemented at the field activity level. In that DOE operating contractors accomplish work through work control processes, it is beneficial to be aware of those ways field sites are effectively implementing ISMS core functions and principles through their work control processes; and then, of equal importance, to promulgate notable practices to the DOE complex.

A representative sample of work control procedures from around the DOE complex was analyzed using a set of criteria derived from the ISMS core functions and principles. A team of work control subject matter experts conducted the analysis to identify notable and outstanding notable practices. The results of the analysis was to be shared within the DOE community to highlight practices which other sites could consider to enhance their work control systems.

SCOPE

The ISM/Enhanced Work Planning (ISM/EWP) National Steering Committee, under the direction of the Safety Management Implementation Team (SMIT),

recognized the significant benefit of facilitating ISM implementation through promoting notable work control practices to the DOE complex. The ISM/EWP National Steering Committee chartered a Work Control and Job Hazards Analysis Work Group (Work Group) to conduct an analysis of work control procedures. The Work Group selected a representative sample of DOE sites to review their procedures. Sites that had a range of missions and variation in size were selected. These included:

- Oak Ridge Y-12 Plant
- Fernald Environmental Project
- Brookhaven National Laboratory
- Los Alamos National Laboratory
- Idaho National Engineering and Environmental Laboratory
- Hanford, Waste Management Operations
- Rocky Flats Environmental Technology Site, and
- Savannah River Site

Additionally, work control procedures from two commercial nuclear power plants were reviewed using the same set of criteria. The purpose of this review was to provide a point of reference. The Work Group Team was composed of recognized work control subject matter experts who have actively participated in the definition and

implementation of ISM at their sites. The Work Group Team developed “lines of inquiry” analysis questions mapping the five ISM core functions and seven principles to the work control process.

Results of the analysis, highlighting notable and outstanding notable practices, is presented in this report; and also at the SMIT sponsored “ISM at the Activity Level” workshop held May 11 and 12, 1999. The report includes:

- An explanation of the Work Control Work Group Team’s analysis process including observations by the Team regarding limitations and conditions for using the information,
- A short description from each site of the work control system reviewed,
- The Composite Site Analysis form for each site, and
- A short discussion of the notable practices identified as a result of the analysis.

NOTABLE PRACTICES

Background

The primary objective of the Work Control Work Group Team (Team) was to identify notable practices in work control procedures which could be shared

throughout the DOE complex. The Team quickly realized that the concept of “notable” was relative. What was “notable” at one site was not as notable at another site. Factors that affected a site’s perception of being notable included the progress or maturity of ISM programs, the nature or type of work covered by the work control procedure, and limited knowledge of improvements made elsewhere.

The Team also took a short time to “normalize” the ratings which were given. The objective was to identify only those practices which were above the expected performance. Consequently, there were a limited number of “2” ratings (Notable Practice) given, and a very limited number of “3” ratings (Outstanding Notable Practice) given. In general, “notable” practices fell somewhere between what the Team thought was normative practice on one side and a true “model” for all others to follow. The Team used their best judgement to rate the borderline practices.

BROOKHAVEN NATIONAL LABORATORY

Integrated Safety Management core functions are integrated throughout the BNL work control procedure. Simplicity and flexibility characterize the BNL procedure. The procedure is intended to be completed

as much as possible in the field, making field adjustments as necessary. The procedure was found to be generally an expert-based process that covers all types of work from maintenance to R&D activities. Participation by all technical disciplines (H&S, Rad., environmental, etc.) is encouraged, but not mandated.

The notable practice was the BNL feedback system. Feedback was required of every job with an easy to use form on the back of the Work Permit form.

HANFORD WASTE MANAGEMENT SYSTEMS

Integrated Safety Management core functions were specifically addressed in a separate section (Section 5.0) of the procedure; however, the ISM functions have been integrated into the work control process. Supporting technical disciplines (H&S, Rad., environmental, etc.) have been integrated into the procedure, mainly within the Automated Job Hazard Analysis (AJHA) tool. The procedure, other than the AJHA, is generally an expert-based process that covers only the core maintenance functions (corrective and preventive maintenance, modifications, other and services.)

The notable practice was the Hanford AJHA for hazards identification and control. This customized, computer-driven tool uses

smart logic to minimize the effort to identify hazards (i.e., answer questions only if a particular hazard is identified.) Supporting technical disciplines are identified in the process. This process is an effective way of promoting (but not mandating) the formation of diverse teams. Hazard controls are identified by the program, and selected to be put into the work instruction by the planner.

FERNALD ENVIRONMENTAL PROJECT

The incorporation of Integrated Safety Management core functions is not intuitively obvious in the procedure. Hazards identification and control is found in other procedures. The Fernald work control procedures is a "stand alone" procedure, and other work control requirements are added in accordance with other site procedures. The Fernald procedure covered only core maintenance activities (corrective and preventive maintenance, modifications, shop work and service.) Supporting technical discipline requirements were not integrated into the procedure; however, diverse teams are facilitated by the electronic approval process, which requires sign-off by all disciplines. Participation is accomplished separately instead of using a round-table approach.

Notable practices found in the Fernald work control procedure included the electronic approval process, line management involvement, computer ties facilitating the feedback process, and the work priority system. The electronic approval process uses a modification to the Lotus Notes computer program. A proprietary Computer Maintenance Management System (CMMS) is used in conjunction to construct the work instruction. Line management is involved using the Lotus Notes program to screen and approve work instructions. Feedback information is captured in the Lotus Notes system and shared with modules in the CMMS. The work priority system, which escalates the level for approval authority for higher priority requested work, was an outstanding notable practice.

IDAHO NATIONAL ENGINEERING AND
ENVIRONMENTAL LABORATORY

The Idaho National Engineering and Environmental Laboratory (INEEL) work control procedure was a draft procedure expected to be implemented at INEEL in April or May, 1999. This procedure is a total re-write of the INEEL work control system, and will apply to all organizations at the site. The procedure totally integrates the

core Integrated Safety Management functions into the INEEL work control process. In this respect, INEEL's procedure is a model for other DOE sites. The INEEL procedure is the single site procedure for work control, but has many references to other procedures were made, such as engineering, materials, etc. The INEEL procedure is limited, however, in that it covers only basic maintenance (corrective and preventive maintenance, modifications and services) work activities. The INEEL procedure tends towards a standards-based process compared to most other procedures, which were expert-based. Much of the volume in INEEL's procedure can be attributed to this. Participation by all technical disciplines (H&S, Rad., environmental, etc.) through the Job Hazards Analysis (JHA) process is encouraged, but not mandated. The work control process is supported by, but not dependent on, the PassPort computerized maintenance management system.

Notable practices included initial work screening, inquiring about lessons learned in the planning phase, identification of training requirements in the hazard control instructions, and a work control priority system. The initial work screening process identified certain types of work (routine

maintenance, emergency maintenance, preventive maintenance) sending such identified work directly to a specific set of work control procedures thereby streamlining the process to some degree. Triggers were included in the work control procedure for planners to query lessons learned data bases. Hazard controls included, not only a description of the control, but also a list of training requirements for the worker which are then incorporated into the work instruction. The work control prioritization process is a logical breakout of priorities where line management approves the priority. Lastly, INEEL takes a different approach to work that can be accomplished by skill-of-the-craft. Craft skills become the criteria as to whether a job can be done as skill-of-the-craft, not what skills the job requires (i.e., the skills of the craft person determine if the job gets done by skill-of-the-craft).

Outstanding notable practices included a graded approach process in distinguishing between the types of work, a comprehensive hazards identification and controls process, and a unique approach to skill-of-the-craft work. Graded approach applications are found throughout the INEEL work control procedures. One graded approach application of particular note is the analyses

of type of work that result in work control process requirements which are effectively tailored to the specific type of work. The Hazards Profile Screening Checklist (HPSC) also screens out not-applicable requirements. The Hazards Identification and Mitigation (HIM) process truly is comprehensive and a model because of its completeness, its promotion of diverse teams, and the differentiation of planning rigor required. The drawback is the effort (resources) needed to complete the procedure.

LOS ALAMOS NATIONAL LABORATORY

The Los Alamos National Laboratory (LANL) work control procedures incorporate and integrate Integrated Safety Management core functions into the procedures. Safe Work Practices, LIR 300-00-02.0, is a good example. The characteristic most obvious of LANL's work control procedures was that they stated program requirements in more general terms resulting in an expert based system. This approach was driven by the de-centralization of operations (16 Facility Management Units) and the diversity in type of work, particularly R&D and laboratory operations. A second, separate work control procedure reviewed covered the maintenance functions

(corrective and preventive maintenance, modifications, other and services.) The requirement in both procedures for involvement of supporting technical disciplines (H&S, Rad., environmental, etc.) existed, but was not emphasized.

The most notable feature of LANL's Safe Work Practices work control procedure was the application of work control to R&D and laboratory operations activities. LANL has recognized that this is a "work-in progress" to institute work controls, which embody Integrated Safety Management functions and principles, into a traditional non-work control area. A second notable practice, not evaluated by the Team's ISM-slanted criteria, and which was a totally unique LANL, was the inclusion in each of the procedures an assessment criteria for determining when the procedures was implemented. LANL separated out the site policy on Graded Approach in a stand-alone procedure. A third notable practice was the prominent recognition of work participation throughout both of the work control procedures. For example, the first category of people identified in the responsibility section (5.0) of the Safe Work Practices procedure was the worker.

OAK RIDGE Y-12 PLANT

The Oak Ridge Y-12 Plant work control related procedures have incorporated the core functions and principles of Integrated Safety Management. The Oak Ridge Y-12 architecture for procedures is to have a procedure for each activity of work control (i.e., scheduling, close the job, job hazards analysis, etc.) Consequently Oak Ridge Y-12 has many procedures. The Oak Ridge Y-12 procedures addressed only corrective and preventative maintenance activities, so they were narrow in scope in that regards. The Oak Ridge Y-12 procedures involved all the technical support disciplines in the job planning process. The Oak Ridge Y-12 procedures had the most "middle of the road" approach between being expert-based and standards-based.

Oak Ridge Y-12 was notable for having the highest average quality, across-the-board set of criteria ratings. No practices were in the outstanding notable practice category, but the Team rated a significant number of the Oak Ridge criteria as a notable practice. These included initial screening, prioritization, hazards identification use of graded approach, divers teams, work planning instructions, scheduling, changes, and closeout.

ROCKY FLATS ENVIRONMENTAL
TECHNOLOGY SITE

Rocky Flats Environmental Technology Site (RFETS) had a single work control procedure that covers all types of work done at the site. This procedure has been written in such a way that the work control process is structured within the sequence of the five core functions of Integrated Safety Management and fully incorporates the functions and principles of Integrated Safety Management. RFETS was the best example of integration of Integrated Safety Management into a work control system. The RFETS procedure was also unique among the other DOE site reviewed in that all types of work (maintenance, construction, operations, environmental restoration and mediation, service and other) were covered under the one procedure. The RFETS procedure was the best example of a work control system that tended to be more standards-based than expert-based. Participation by all technical disciplines (H&S, Rad., environmental, etc.) was mandated when respective hazards were identified.

Notable practices included initial job screening and authorization, prioritizing, worker involvement, lessons learned screening, work authorization and feedback.

Line management performs the initial screening, authorization and setting the priority. Requirements for the worker to participate in the job walkdown, hazards identification, and work instruction approval is mandatory in most cases. Hazard controls are driven by the hazard identified as a result of the job hazards analysis process. Work authorization requires concurrence by each technical support discipline identified in the hazards identification step prior to approval by line management. Lessons learned screening and feedback requirements are included in the planning phase.

The outstanding notable practices included application of the graded approach, hazards identification, forming diverse teams, establishing a degree of rigor for planning, hazards controls, and identification of hazards specific job training requirements. The principle of graded approach is demonstrated throughout the procedure including screening the types of work; hazards identification; setting up diverse teams; and determining the level of planning, based on risk, complexity, etc., needed to plan the job. Job hazards are identified in both a pre-screen process and when a job hazards analysis is done. The forming of diverse teams is driven (standards-based) by the analysis of job

hazards, i.e., participation and review/approval phases is mandatory when identified in the hazards identification phase. The pre-screening process determines (numerical scale) the rigor of planning (requirements) for the job. The job hazards analysis process determines both the appropriate controls and the unique training required of the workers.

SAVANNAH RIVER SITE

The Savannah River Site (SRS) architecture for procedures consists of multiple manuals (broad subject areas like maintenance, safety, engineering, etc.) and multiple procedures within each manual. Procedures reviewed included the site-wide maintenance work control procedure, and two safety procedures: the Job Hazards Analysis program and the Work Clearance and Authorization program. SRS has validated that the Integrated Safety Management functions and principles are included in their procedures; however, upon a reading of the work control procedures reviewed, the terminology of Integrated Safety Management functions and principles is not used. All supporting technical disciplines (Industrial Health, Rad., environmental) participate in the work control process through the Work

Management Center. The SRS procedures tend towards being expert-based. The SRS work control procedure covers all work performed onsite by maintenance and construction organizations, including corrective maintenance, services, modifications, preventive maintenance, etc. Excluded from the requirements of the work control procedure is project work. The work control process is heavily dependent upon the PassPort computerized maintenance management system as many procedure instructions related to using the PassPort system.

The formulation and performance of diverse teams was a notable practice. The SRS practice of screening work through the Fix It Now (FIN) teams, and, if the work needs more hazards identification and job planning, it is passed on to the Work Management Centers (WMC's) where resident technical support discipline personnel join in the process. The WMC's function as a fully integrated team at the SRS.

COMMERCIAL NUCLEAR POWER PLANTS

Note: Work control procedures from two commercial nuclear power plants were evaluated using the same ISM lines of

inquiry as used for the DOE sites. The purpose of evaluating the commercial plants was to provide some external reference for DOE site work control procedures. Caution should be exercised in drawing conclusions or comparing this analysis information, as there are substantial differences in mission, organization and management direction.

COMMERCIAL NUCLEAR PLANT #1

A set of seven work control-related procedures/documents were evaluated from Commercial Nuclear Plant #1. Since no dedicated program such as Integrated Safety Management was in effect at this plant, the work control procedures presented a traditional approach to work control of maintenance and related activities. These procedures covered primarily maintenance, engineering support, and modification activities, but also included an additional procedure to address the hazards and necessary controls for high radiation risk work. There was no direct counterpart to comprehensive hazards identification and controls in the commercial work control practices. There is however a formalized, computer-based process for identifying key nuclear safety risk issues (core melt and plant trip risks) resulting from the risks posed to the plant of all maintenance and

work activities being done at the plant at any given time. Additionally, there is strong reliance on worker "skill-of-the-craft" and planner expertise for the safe conduct of work activities.

Notable and outstanding notable practices were present in the areas of work scheduling, risk/hazard identification (in the context of nuclear plant operations), document configuration control, and work process integration (engineers/planners). The plant uses a scheduling/project management system that is directly linked to the planning system. Additionally, all work activities done at the plant (including operations) is included on the integrated plant schedule. Similarly, a formalized process is used for identifying, screening, and scheduling work activities that includes line management, SMEs, planners, engineers, and work control personnel. Plant risk assessment process identifies impact to nuclear safety from individual work activities, as well as collective impact of all work activities, and is updated on a daily basis. Roles and responsibilities are clearly understood and work authorization requirements are clearly defined and are part of work and supervisor training. Changes to plant systems resulting from maintenance or work activities are updated in master

drawings immediately upon completion of the work. Drawings are maintained on a computer system for ease of use in work package preparation and engineering design support. Engineering support and design is well integrated into work control and planning.

COMMERCIAL NUCLEAR PLANT #2

A set of five work control-related procedures were evaluated from Commercial Nuclear Plant #2. Since no dedicated program such as Integrated Safety Management was in effect at this plant, the work control procedures presented a traditional approach to work control of maintenance activities. These procedures covered only maintenance and modifications performed through the maintenance activity. There was no programmatic counterpart to the hazards identification and hazards control functions in the commercial Nuclear Plant #2 procedures, although safety areas and safety controls were included. The procedures reflected a formalized process (heavy use of flow diagrams) and a strong culture of Conduct of Maintenance.

Notable and outstanding notable practices were found in those phases of work control that would be expected. Namely, the areas were initial screening, work coordination,

material logistics, scheduling, control of the work execution, and post-job evaluation. Work requirements were thoroughly screened to validate the need of the work and to determine how best to accomplish the work, whether it be Tool Pouch, minor maintenance, on-line or work request. Comprehensive material planning and scheduling requirements were driven by the need to do maximum maintenance during an outage period. Extensive post-performance reviews, lessons learned and analyses were done as part of their continuous improvement program.

ABOUT THE TEAM

This analysis was conducted by a team of experts representing the various sites analyzed, along with a support from a Department of Energy Headquarters representative, and a work control consultant. The personnel representing this team have well over 200 total years work control experience, and were well suited to conduct this analysis. The following provides a list of the participating sites with the respective team members.

Brookhaven National Laboratory

William Harrold

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RFETS

Steven Little

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SRS

Richard Lane

Jackie Wilkinson

DOE EH-52

Joseph Krupar

Independent Consultant

Dennis Morris

**ATTACHMENT 1
ANALYSIS COMPARISON**

LINES OF INQUIRY	BNL	FERNALD	HANFORD	INEEL	LANL	OR (Y-12)	RFETS	SRS	COMM #1	COMM #2
1) How effective is this work control document in defining the work scope?	1.2	1.2	1.0	1.6	1.0	1.6	2.0	1.0	1.0	1.6
a) How effective is the document in work identification?	1	1	1	1	1	1	1	1	1	1
b) How effective is the document in initial work screening?	1	1	1	2	1	2	2	1	1	2
c) How effective is the document in requiring initial work authorization?	1	1	1	1	1	1	2	1	1	2
d) How well does this document involve the line management?	1	2	1	1	1	2	2	1	1	1
e) How effective is the document in applying the graded approach in distinguishing between the various types of work?	2	1	1	3	1	2	3	1	1	2
2) How effective is this work control document in identifying the hazards?	1.3	0.3	1.6	2.3	1.3	1.7	2.7	1.2	1.4	0.6
a) How comprehensive is this document in hazard identification?	1	0	2	3	1	2	3	1	1	1
b) To what degree are tools (e.g., computerized, checklists, etc.) used for hazard identification?	2	0/R	2	2	1	2	2	1	2	1
c) How well is the graded approach used in hazard identification?	1	0	2	2	2	1	3	R	2	0
d) How well is the graded approach used in forming diverse teams?	1	0	2	2	1	2	3	2	1	1
e) How effective is this procedure for distinguishing between low, medium and high hazard tasks?	2	0	1	2	1	1	3	R	2	1

Legend

0 = Not Included in Document
1 = Addressed in Document, DOE Normative Practice
2 = Notable Practice
3 = Outstanding Notable Practice, DOE Model
R = Referenced to another procedure not reviewed by Team

**ATTACHMENT 1
ANALYSIS COMPARISON**

LINES OF INQUIRY	BNL	FERNALD	HANFORD	INEEL	LANL	OR (Y-12)	RFETS	SRS	COMM #1	COMM #2
f) To what level is the worker involved?	1	1	1	2	2	2	2	1	1	0
g) To what level are other organizations involved? (consider the following):	1	1	1	3	1	2	3	1	1	1
3) How effective is this work control document in identifying and incorporating the hazard controls in the work instructions?	1.0	0.8	1.3	2.0	1.0	1.1	1.9	0.6	1.4	0.8
a) How comprehensive is this document in identifying the appropriate hazard controls based on the hazards identified?	1	1	2	3	1	1	3	1	2	1
b) How effective (ease of use, probability of use) is this document in identifying the appropriate hazard controls based on the hazards identified?	1	1	2	2	1	1	2	1	1	1
c) How effective is this document in incorporating the hazard controls into the appropriate work document?	1	1	1	1	1	2	2	1	1	1
d) How well does this document apply the graded approach concept in the planning and preparation of work documents (i.e., is this document flexible in format and content based on the application)?	2	1	1	2	1	1	2	1	1	1
e) How well are lessons-learned and feedback incorporated into the planning process?	0	0	1	2	0	1	2	0	1	0
f) How well does the document address "skill-of-craft" principles into the development of the work documents?	1	1	1	3	1	1	1	0	2	1
g) How well does this document implement engineering design changes?	R	R	1/R	1	1/R	R	1	1	2	1

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**ATTACHMENT 1
ANALYSIS COMPARISON**

LINES OF INQUIRY	BNL	FERNALD	HANFORD	INEEL	LANL	OR (Y-12)	RFETS	SRS	COMM #1	COMM #2
h) To what level is the worker involved?	1	1	1	2	2	1	2	0	1	0
4) How effective is this work control document in the work performance?	1.0	1.3	1.0	1.0	1.1	1.6	1.5	1.0	1.4	1.7
a) How effective is this document in material requisitioning and procurement?	1	1	1	1	1	1	1	1	1	2
b) How effective is this document in ensuring adequate work authorization (to include work document review, approval, and work release)?	1	2	1	1	2	1	2	1	2	2
c) How effective is this document in work scheduling?	1	1	1	1	1	2	R	1	3	3
d) How effective does this document address pre-job briefings?	1	1	1	1	1	1	1	1	1	1
e) How effective does this document address work execution instructions?	1	1	1	1	1	2	2	1	1	1
f) How effective and flexible is this document in addressing document revisions and field changes?	1	1/R	1	1	1	2	2	1	1	2
g) How effective is this document in addressing post-performance testing and acceptance?	1	2/R	1	1	1	2	1	1	1	1
5) How effective is this work control document in soliciting feedback?	1.3	1.5	1.0	1.0	1.0	1.3	1.3	0.5	1.0	1.5
a) How effective is this process in ensuring adequate close-out of the work documents?	0	1	1	1	1	2	1	1	1	1
b) How well does the document solicit/input feedback?	1	1	1	1	1	1	1	0	1	1
c) Does this document provide an avenue to obtaining feedback (e.g., does this process describe a post-job review approach)?	2	2	1	1	1	1	2	1	1	2

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**ATTACHMENT 1
ANALYSIS COMPARISON**

LINES OF INQUIRY	BNL	FERNALD	HANFORD	INEEL	LANL	OR (Y-12)	RFETS	SRS	COMM #1	COMM #2
d) How flexible and user-friendly is this feedback system?	2	2	1	1	1	1	1	0	1	2
6) How effective is the work control document in addressing the training and qualification requirements?	1.0	0.0	1.0	1.5	1.0	R	2.0	R	1.0	0.5
a) How effective is the work control document in identifying job unique training and qualification requirements?	1	0	1/R	2	1	R	3	0	1	0
b) How effective is the work control document in verifying that training and qualification requirements are verified prior to the start of work?	1	0	1	1	1	R	1	1	1	1
7) How adequately does the work control document address the roles and responsibilities for those personnel involved?	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
8) How well does the work control document address the balance of priorities with respect to safety implications and time?	1.0	3.0	1.0	2.0	1.0	2.0	2.0	1.0	1.0	1.0

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ATTACHMENT 2
ANALYSIS COMPARISON (WORK CONTROL)

The following chart provides a comparison of the analyses performed as they relate to standardized work control elements, rather than in the context of ISMS.

SITE LOCATION	WORK CONTROL ELEMENTS															
	Work Identification	Work Screening	Work Authorization	Hazard Identification	Hazard Analysis	Hazard Controls	Engineering	Work Planning	Materials Procurement	Scheduling	Pre-Job Briefings	Work Execution	Revisions & Field Changes	Post Testing	Close-Out	Feedback
Brookhaven National Labs (BNL)	1.0	1.0	1.0	1.3	1.3	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	1.7
Fernald	1.0	1.0	1.0	0.0	0.3	0.8	R	0.8	1.0	1.0	1.0	1.0	1.0	2.0	1.0	1.3
Hanford	1.0	1.0	1.0	2.0	1.6	1.3	1/R	1.3	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
INEEL	1.0	2.0	1.0	2.3	2.3	2.0	1.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.3
LANL	1.0	1.0	1.5	1.3	1.3	1.0	1/R	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Oak Ridge (Y-12 Plant)	1.0	2.0	1.0	1.7	1.7	1.1	R	1.1	1.0	2.0	1.0	2.0	2.0	2.0	2.0	1.0
Rocky Flats (RFETS)	1.0	2.0	2.0	2.7	2.7	1.9	1.0	1.9	1.0	R	1.0	2.0	2.0	1.0	1.0	1.7
Savannah River (SRS)	1.0	1.0	1.0	1.0	1.2	0.6	0.0	0.6	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.7
Commercial Plant #1	1.0	1.0	1.5	1.7	1.4	1.4	2.0	1.4	1.0	3.0	1.0	1.0	1.0	1.0	1.0	1.0
Commercial Plant #2	1.0	2.0	2.0	0.7	0.6	0.8	1.0	0.8	2.0	3.0	1.0	1.0	2.0	1.0	1.0	1.3
Corresponding Question(s) – From Site Analysis Form	1a	1b	1c/4b	2a/2b/2c	2	3	3g	3	4a	4c	4d	4e	4f	4g	5a	5b/5c/3d

Legend

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ATTACHMENT 2
ANALYSIS COMPARISON (WORK CONTROL)

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ATTACHMENT 3
SITE ANALYSIS – BROOKHAVEN NATIONAL LABORATORY

WORK CONTROL SUMMARY

The Plant Engineering Division provides maintenance and modification service for the entire BNL site, and works primarily from a central shop configuration. The Work Planning and Control Procedure EP-ES&H-006, documents how work is managed by the Maintenance and Design Engineering groups in order to conform to the lab standard, ES&H Standard 1.3.6, "Work Planning and Control for Operations". The maintenance work control system functions as follows.

Screening the Jobs/Graded Approach:

Each department has a Work Control Manager (part time assignment) who has responsibility for implementing the work control standard and monitoring the quality of application. The Work Control Manager appoints Work Control Coordinators (WCC) who have the responsibility to screen all work requests for their area or group. The WCC does an initial screening of job requests into a **low, moderate, or high** category. The low category jobs are the skill of the craft ones that require minimum

paperwork/supervision. A moderate or high job requires that a **work permit** (see section below) be filled out documenting the job description, hazards, controls, reviews, and authorizing signatures. If an SOP (Standard Operating Procedure) exists for a moderate or high hazard job, a work permit is not needed. Low, moderate, and high screening guidelines are presented in the procedure for the WCC's to use as a criteria.

Work Permit

A work permit is required for all Plant Engineering jobs that are considered moderate or high hazard. The work permit form drives the hazard analysis, hazard controls, final hazard category determination, work plans, line management and ES&H reviews, pre-job briefing, work authorization, and post-job review. The permit was designed as a one page form (front and back) for simplicity and ease of utilization in the field. Detailed planning information and safety permits are attached to the work permit as needed.

Processing Work Requests

ATTACHMENT 3
SITE ANALYSIS – BROOKHAVEN NATIONAL LABORATORY

Each person calling in a work request to the Maintenance Management Center, MMC, is asked by the clerk if a work permit is required. For jobs requiring a permit, line management is responsible for arranging the walkdown meeting with the maintenance supervisor or planner, trades person, and appropriate ES&H personnel. The walkdown team conducts the hazard analysis and determines the hazard controls. A final categorization (low, moderate, or high) of the work is made by the team. All information is recorded onto the work permit or is attached.

For jobs not requiring a permit, the work is handled as a skill of the craft assignment unless the maintenance supervisor or worker decides during the job walkdown that a permit is needed.

On all design engineering jobs, a work permit is automatically required and is utilized as a tool to reinforce to the contractor crews the safety precautions written into the design and work specifications.

The Plant Engineering Work Control Procedure describes the system for subsequently planning, scheduling, and

executing the work. Maintenance's software system for tracking and controlling work requests is obsolete and will be replaced later this year. The contract award for the new maintenance software (likely to be either Maximo or Data Spread) will occur in May.

NOTABLE PRACTICES

Integrated Safety Management core functions are integrated throughout the BNL work control procedure. Simplicity and flexibility characterize the BNL procedure. The procedure is intended to be completed as much as possible in the field, making field adjustments as necessary. The procedure was found to be generally an expert-based process that covers all types of work from maintenance to R&D activities. Participation by all technical disciplines (H&S, Rad., environmental, etc.) is encouraged, but not mandated.

The notable practice was the BNL feedback system. Feedback was required of every job with an easy to use form on the back of the Work Permit form.

ATTACHMENT 3
SITE ANALYSIS – BROOKHAVEN NATIONAL LABORATORY

CONTACT INFORMATION

Work Control Contact:	Patricia Williams	Address / Phone:	53 Bell Avenue, Upton, NY 11973-5000 (516) 344-4532
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PROCEDURE REVIEWED

Procedure Number:	Revision:	Title:	Status:
EP-ES&H Standard 1.3.6	1	Work Planning and Control System	Approved

GENERAL NOTES & COMMENTS

The Brookhaven National Laboratory (BNL) work control procedure is appropriate for a small site with a wider range of types of work, including Research and Development laboratory work. The BNL work control procedure document is a simplified presentation of a complete work control process. The BNL work control procedure should generally be considered an “expert-based” approach to work control. The BNL work control procedure has implemented the core functions of ISMS into the procedure.

The noteworthy parts of the BNL Work Planning and Control Procedure are:

- Concise one page work permit form drives all of the ISMS core functions. Attachments are made to the form as rigor increases and as driven by the hazard and work controls analysis.
- Work permit is user friendly in the field for the hands-on personnel to make work classification determinations, hazards identification, etc.
- Second screening in field walkdown allows the planning rigor to be adjusted.
- Key Plans help in identification or high-lighting of location hazards (as opposed to task hazards.)
- Trades frequently ask for a work permit on jobs they don’t feel comfortable with.
- Presentation of a Graded Approach policy.
- Hazards identification is facilitated by three aids in the procedure:
 - Work Permit Form Section 2
 - Key Plan-a map of hazard areas for each building
 - Table 1 Screening Guidelines
- Post job review feedback system.

The BNL work control process is documented in two levels of procedures. ESH Standard 1.3.6, Work Planning and Control System, is the site standard, and a second tier procedure is written for each of eleven departments.

The BNL Work Planning and Control System procedure is not computer dependent, and is short and sweet.

ATTACHMENT 3
SITE ANALYSIS – BROOKHAVEN NATIONAL LABORATORY

ANALYSIS DATA			
Lines of Inquiry	Score	Procedure Locator	Justification / Comments
1) How effective is this work control document in defining the work scope?	1.2	IV.A., B. &C,	
e) How effective is the document in work identification?	1	IV.A.1. &2.	
f) How effective is the document in initial work screening?	1		
g) How effective is the document in requiring initial work authorization?	1		No one can request work without an account number.
h) How well does this document involve the line management?	1	IV. B.	Work Control Coordinator, Work Control Manager
f) How effective is the document in applying the graded approach in distinguishing between the various types of work?	2	IV.C.2. &3. Table 1	Table and narrative screening guidelines provided.
2) How effective is this work control document in identifying the hazards?	1.3		
h) How comprehensive is this document in hazard identification?	1	IV. C.4	
i) To what degree are tools (e.g., computerized, checklists, etc.) used for hazard identification?	2	WP Form, Table1 IV.C.5	Work Permit portable checklist used in field, Key Plans help identify facility hazards, Form F3090, Section 2, and Table 1
j) How well is the graded approach used in hazard identification?	1		
k) How well is the graded approach used in forming diverse teams?	1	WP Form, IV.C.4	SME's are identified in WP Form Section. Required for medium and high. No system to ensure teams ore formed. Table 1 and Guidelines.
l) How effective is this procedure for distinguishing between low, medium and high hazard tasks?	2	IV. C.3 and 3, Table 1	Table 1 examples are helpful. Screening guidelines provided; initial screening by the Work Control Coordinators plus a second screening upon job walkdown. Low includes minor maintenance, Standard Work Order, no paper work. Process is "expert-based."

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ATTACHMENT 3
SITE ANALYSIS – BROOKHAVEN NATIONAL LABORATORY

Lines of Inquiry	Score	Procedure Locator	Justification / Comments
m) To what level is the worker involved?	1	IV.D.3	A requirement, but not emphasized.
n) To what level are other organizations involved? (consider the following):	1	IV.C.4	Listed on WP Form
• Environmental			
• Industrial Hygiene			
• Occupational Safety			
• Radiological Control			
• Engineering			
• Quality Assurance/Control			
• Facility/Operations/Departmental Personnel			
• Fire Protection			
• Criticality Safety			
• Nuclear Safety			
• Waste Management			
3) How effective is this work control document in identifying and incorporating the hazard controls in the work instructions?	1.0	IV, WP Form, Table 1	
a) How comprehensive is this document in identifying the appropriate hazard controls based on the hazards identified?	1	WP Form Section 2	References to standards are given on WP Form, Section 2. Controls are checked on form.
b) How effective (ease of use, probability of use) is this document in identifying the appropriate hazard controls based on the hazards identified?	1		

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ATTACHMENT 3
SITE ANALYSIS – BROOKHAVEN NATIONAL LABORATORY

Lines of Inquiry	Score	Procedure Locator	Justification / Comments
c) How effective is this document in incorporating the hazard controls into the appropriate work document?	1	WP Form, Section3	Work Permit Form preparation instructions attached to the form. Flexibility to change the hazard rating and planning rigor during the field walkdown.
d) How well does this document apply the graded approach concept in the planning and preparation of work documents (i.e., is this document flexible in format and content based on the application)?	2	WP Form	Flexibility in field to change hazard category during walkdown.
e) How well are lessons-learned and feedback incorporated into the planning process?	0	IV.D.	No reference to Lessons Learned
f) How well does the document address "skill-of-craft" principles into the development of the work documents?	1	IV.C.1., IX	Good definition.
g) How well does this document implement engineering design changes?	R	IV.G.	Plant web site used.
h) To what level is the worker involved?	1		
4) How effective is this work control document in the work performance?	1.0	IV.D. to G.	
h) How effective is this document in material requisitioning and procurement?	1	IV.D.5.	Only general reference statement. Sign off that "conditions are appropriate to start."
i) How effective is this document in ensuring adequate work authorization (to include work document review, approval, and work release)?	1	WP Form Section 3, 5	Approval discussion not found. Work release found on WP Form, Section 5. Meets DOE expectations.
j) How effective is this document in work scheduling?	1	IV.E.	Points to another procedure.
k) How effective does this document address pre-job briefings?	1	IV.F., WP Form Section 4	
l) How effective does this document address work execution instructions?	1	WP Form Section 3	Worker signoff acknowledging, understanding and permit requirements good practice. Meets DOE expectations.
m) How effective and flexible is this document in addressing document revisions and field changes?	1	IV.G.	General reference only. WP Form Section 3

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SITE ANALYSIS – BROOKHAVEN NATIONAL LABORATORY

Lines of Inquiry	Score	Procedure Locator	Justification / Comments
n) How effective is this document in addressing post-performance testing and acceptance?	1	IV.D.8.	WP Form Section 3
5) How effective is this work control document in soliciting feedback?	1.3		
d) How effective is this process in ensuring adequate close-out of the work documents?	0		No requirement for close out, only feedback.
e) How well does the document solicit/input feedback?	1		WP Form Section 6 and 7, Attachment 5 Survey form
f) Does this document provide an avenue to obtaining feedback (e.g., does this process describe a post-job review approach)?	2	Work Permit, Section 7	Feedback form is printed on the back of each work request form. User friendly.
e) How flexible and user-friendly is this feedback system?	2		Minimum writing required of the worker.
6) How effective is the work control document in addressing the training and qualification requirements?	1.0		
a) How effective is the work control document in identifying job unique training and qualification requirements?	1	WP Form Section 2	
b) How effective is the work control document in verifying that training and qualification requirements are verified prior to the start of work?	1		Only for location specific training as noted on work permit.
7) How adequately does the work control document address the roles and responsibilities for those personnel involved?	1.0	III.	
8) How well does the work control document address the balance of priorities with respect to safety implications and time?	1.0		

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ATTACHMENT 3
SITE ANALYSIS – BROOKHAVEN NATIONAL LABORATORY

GENERAL SITE QUESTIONS	
Question	Response
1) How adaptable is this document to other DOE Sites?	Very adaptable because so generic and not software driven.
2) How broad of a spectrum does this document cover?	Covers all steps in the work control process. Covers structures, systems and components.
a) Can this document be used for the following activities?	Intended to cover all types of work.
• Corrective Maintenance	Yes
• Preventive Maintenance	Yes
• D&D	Yes
• Operations	Yes
• Construction	Yes
• R&D	Yes
• Environmental Restoration/Remediation	Yes
• Other (i.e., Services, Surveillances, utilities, Service technicians, etc.) – Specify	Yes
• Services/Warranty Type Work	Yes
3) Does this work control document require the support of a CMMS? – Specify Software Used.	Computer not required.

ATTACHMENT 3
SITE ANALYSIS – BROOKHAVEN NATIONAL LABORATORY

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ATTACHMENT 4
SITE ANALYSIS – FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

WORK CONTROL SUMMARY

At Fernald Environmental Management Project (FEMP), work control is focused into three primary areas. The first area is focused on Preventive maintenance (PM) work orders. These are pre-engineered and essentially pre-planned work orders that are automatically generated at set intervals based on the equipment and also upon engineering recommendations.

The second area of work control is Corrective Maintenance, Alterations, or Fabrication work orders. These are the most labor intensive work orders, and involve reviews from seven support groups that include Occupational Safety and Health, Nuclear & Systems Safety, Quality Assurance, Fire Protection, Engineering, and Radiological Controls. These work orders are electronically routed through a “Lotus Notes” database, otherwise known as the Automated Work Package Program (AWP). AWP also include reviews from Cost Account Managers, Facility Owners/Area Facility Owners, Planners, and also a Davis-Bacon preliminary review (when applicable). These type of work orders are

sent to the scheduling department when ready to work, and then on to the field when required permits are obtained by the planning department. After reaching the field, the supervisor or job coordinator obtains any further required permits before execution begins.

The third area of work control is described as a Maintenance Ticket, which are also included in the AWP system. These Maintenance Tickets are for jobs requiring two men less than eight hours each to complete. These are essentially minor problems that don’t involve the reviews associated with the planned activities described above.

NOTABLE PRACTICES

The incorporation of Integrated Safety Management core functions is not intuitively obvious in the procedure. Hazards identification and control is found in other procedures. The Fernald work control procedures is a “stand alone” procedure, and other work control requirements are added in accordance with other site procedures. The Fernald procedure covered only core

ATTACHMENT 4
SITE ANALYSIS – FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

maintenance activities (corrective and preventive maintenance, modifications, shop work and service.) Supporting technical discipline requirements were not integrated into the procedure; however, diverse teams are facilitated by the electronic approval process, which requires sign-off by all disciplines. Participation is accomplished separately instead of using a round-table approach.

Notable practices found in the Fernald work control procedure included the electronic approval process, line management involvement, computer ties facilitating the feedback process, and the

work priority system. The electronic approval process uses a modification to the Lotus Notes computer program. A proprietary Computer Maintenance Management System (CMMS) is used in conjunction to construct the work instruction. Line management is involved using the Lotus Notes program to screen and approve work instructions. Feedback information is captured in the Lotus Notes system and shared with modules in the CMMS. The work priority system, which escalates the level for approval authority for higher priority requested work, was an outstanding notable practice.

ATTACHMENT 4
SITE ANALYSIS – FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

CONTACT INFORMATION

Work Control Contact:	Address / Phone:
Clarence Smith or Joe Legge	FEMP P.O. Box 583704, Cincinnati, Ohio 45253 (513) 648-4574

PROCEDURE REVIEWED

Procedure Number:	Revision:	Title:	Status:
MT-003	8	FEMP Work Request/Order Procedure	Approved

GENERAL NOTES & COMMENTS

1. The Fernald FEMP Work Order System is a Lotus Notes Automated Maintenance Work Package System with electronic approval signature that will allow each approver (seven different organizations IH, ES&H, FP, QA, RAD, NS and ENG, see section 2 item g for the listing) to review, approve and attach appropriate work control permits in their portion of the work package. The system allows real-time tracking of work request status.
2. The Lotus Notes Automated Maintenance Work Package System works in conjunction with the FEMP Site Computerized Maintenance Management System (CMMS) which tracks equipment, equipment history, materials, manpower, costs, and other management parameters. This CMMS is a Fluor Daniel company proprietary program.
3. The FEMP Work Request/Order procedure presents a traditional approach to work control in that requirements external to core work control functions (i.e., engineering, hazards analysis, etc.) are ADDED to the process by reference to another procedure. Integrated Safety Management principles are not intuitively obvious in this procedure.
4. MT-003 does not cover training requirements; however, all maintenance training, qualifications, certification are controlled and tracked by the Training Department and training procedure M-122 that is mandatory for all management and maintenance personnel to attend at regular intervals. Special training and vendor training is on a case-by-case basis.
5. The management and maintenance personnel responsibilities are outlined through out the work procedure. Summary responsibility statements for all positions is found in Section 4.0.
6. The Fernald Work Request/Order Procedure covers corrective maintenance, preventive maintenance, alterations and shop fabrications only. Construction and various types of operations work activities are covered by other procedures.
7. Fernald Maintenance has other documents/procedures that are required to be followed most of which are listed within the maintenance procedure. Those that are not listed are in compliance with the 18 elements of the DOE 4330.1B, and M-143 Fernald Maintenance Implementation Plan (MIP). Some of the procedures which have to be used in conjunction with MT-003 to accomplish maintenance work include:
 - a. Engineering Design, ED-12-7002
 - b. Engineering Design Change Process, ED-12-5002
 - c. Safety Performance Requirements, RM-0021
 - d. Facility Engineering Projects, ED-12-4012
 - e. Request for Purchase (Sub-contracted work), AC-001
 - f. Operations Activities such as safe shut-down, D&D work, etc. are found in other procedures.
8. No forms, tables, charts, etc. were included in the procedure.

ATTACHMENT 4
SITE ANALYSIS – FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

ANALYSIS DATA			
Lines of Inquiry	Score	Procedure Locator	Justification / Comments
1) How effective is this work control document in defining the work scope?	1.2		
a) How effective is the document in work identification?	1	2.1, 4.2, 4.7, 4.9, 4.10	No screens or checklists were contained in the procedure.
b) How effective is the document in initial work screening?	1	4.1, 7.1	
c) How effective is the document in requiring initial work authorization?	1	7.1.3, 7.1.7, 7.1.10	7.1.3-Need is validated. 7.1.10-Funding availability is verified.
d) How well does this document involve the line management?	2	4.2, 7.1.3-7.1.9, 7.1.45, 7.1.46	Authorization by the Facility Owner at several places through the Lotus Notes system.
e) How effective is the document in applying the graded approach in distinguishing between the various types of work?	1	7.1, 7.2, 7.3, 7.1.19, 7.1.20 10-1, Attachment 3	This procedure provides instructions for the graded approach as it applies to maintenance activities (CM, PM, Automated Work Ticket)
2) How effective is this work control document in identifying the hazards?	0.3		Note: Identifying hazards was not covered in the MT-003 procedure, but in RM-0021, Safety Performance Requirements, which was not reviewed.
a) How comprehensive is this document in hazard identification?	0	7.1.7, 7.1.27, Attachment 2	7.1.7-Simply a list of categories. Discrete hazards are not identified. Hazard identification process was not discussed.
b) To what degree are tools (e.g., computerized, checklists, etc.) used for hazard identification?	0/R	7.1.7, 7.1.24, Attachment 2	No specific references cited. RM-0021, Safety Performance Requests covers hazards. Attachment 2 lists permits that may be needed.
c) How well is the graded approach used in hazard identification?	0		
d) How well is the graded approach used in forming diverse teams?	0	7.1.21, 7.1.24	7.1.21-"As required" basis only, Support Organization Representatives are required to review all work orders, however, there is no requirement or mention of this in the procedure.

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SITE ANALYSIS – FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Lines of Inquiry	Score	Procedure Locator	Justification / Comments
e) How effective is this procedure for distinguishing between low, medium and high hazard tasks?	0		The procedure does not speak to a planning graded approach.
f) To what level is the worker involved?	1	7.1.19, 7.1.21, 7.1.39	7.1.21-Subjective determination is made by the planner.
g) To what level are other organizations involved? (consider the following):	1	4.9, 7.1.7, 7.1.24	7.1.21-Planner decides who goes on walkdown. "As Required" requirement. 7.1.29-Engineering walkdown is "As Required"
• Environmental			Approval required on all work orders.
• Industrial Hygiene			Approval required on all work orders.
• Occupational Safety			Approval required on all work orders.
• Radiological Control			Approval required on all work orders.
• Engineering			Approval required on all work orders.
• Quality Assurance/Control			Approval required on all work orders.
• Facility/Operations/Departmental Personnel			Approval required only as the originator.
• Fire Protection			Approval required on all work orders.
• Criticality Safety			Same as Nuclear Safety
• Nuclear Safety			Approval required on all work orders.
• Waste Management			Approval required only as originator.
3) How effective is this work control document in identifying and incorporating the hazard controls in the work instructions?	0.8		
a) How effective (ease of use, probability of use) is this document in identifying the appropriate hazard controls based on the hazards identified?	1	7.3 notes, Attachment 2	Attachment 2 is a list of organizations only, No controls identified.

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Lines of Inquiry	Score	Procedure Locator	Justification / Comments
b) How effective is this document in incorporating the hazard controls into the appropriate work document?	1		All of the permits and job safety analysis are automatically attached to the Work Order by the Lotus Notes computer system.
c) How well does this document apply the graded approach concept in the planning and preparation of work documents (i.e., is this document flexible in format and content based on the application)?	1		All of the permits and the job safety analysis are automatically attached to the Work Order by the Lotus Notes computer system. The Lotus Notes Administrator tracks status of all work orders during the approval process.
d) How well are lessons-learned and feedback incorporated into the planning process?	1	7.1.19, 10.12, Attachment 2	Allows for a two part work request/order.
e) How well does the document address “skill-of-craft” principles into the development of the work documents?	0	7.1.56	No requirements in the planning process.
f) How well does the document address “skill-of-craft” principles into the development of the work documents?	1	7.1.19 (Note)	
g) How well does this document implement engineering design changes?	R	4.11 to 4.11.9	ED-12-5002 Engineering Design Change Process
h) To what level is the worker involved?	1	7.1.19	General references in procedure.
4) How effective is this work control document in the work performance?	1.3		
a) How effective is this document in material requisitioning and procurement?	1	7.1.30, 7.1.32	FDF Planners have company credit cards and follow the requirements Procedure AC-0006, Credit Card Purchase
b) How effective is this document in ensuring adequate work authorization (to include work document review, approval, and work release)?	2	7.1.23to 7.1.27, 7.1.38, Attachment 2	Required approvals for release of work activities.
c) How effective is this document in work scheduling?	1	7.1.32 to 7.1.37 7.2.6	The scheduling is for regular maintenance. Preventive maintenance.
d) How effective does this document address pre-job briefings?	1	7.1.39	The Pre-job briefing is automatically attached to the work order when it is printed out and is mandatory for all maintenance work activities on site.

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Lines of Inquiry	Score	Procedure Locator	Justification / Comments
e) How effective does this document address work execution instructions?	1	7.1.32 to 7.1.49	
f) How effective and flexible is this document in addressing document revisions and field changes?	1/R	7.1.48	ED-12-5002, Engineering Design Change Process
g) How effective is this document in addressing post-performance testing and acceptance?	2/R	4.11.8, 7.1.31, 7.1.41	The Post Maintenance Performance Test (PMPT) if required ensures involvement by Facility Engineering, Project System Engineering, and the Planner/Estimator. References MT-0015, Post Maintenance Performance Testing.
5) How effective is this work control document in soliciting feedback?	1.5		
a) How effective is this process in ensuring adequate close-out of the work documents?	1	7.1.42 to 7.1.57, 7.2.19 to 7.2.26, 7.3.8, 7.3.12	These areas address the close out requirements for work orders, PM's and Maintenance Work Tickets.
b) How well does the document solicit/input feedback?	1	7.1.2, 7.1.4, 7.1.39, 7.2.25, 7.2.28	Lesson Learned interfaces not fully described in the procedure.
c) Does this document provide an avenue to obtaining feedback (e.g., does this process describe a post-job review approach)?	2	7.1.49, 7.1.55	This procedure works in unison with their Lesson Learned process and all information is entered into their CMMS, which can be accessed by all applicable personnel.
d) How flexible and user-friendly is this feedback system?	2		Rating given for automation in the Lotus Notes system.
6) How effective is the work control document in addressing the training and qualification requirements?	1		
a) How effective is the work control document in identifying job unique training and qualification requirements?	0/R		Site requirements for training is located in Procedure M-122, "Training Qualification Requirements" and is mandatory for all maintenance personnel.
b) How effective is the work control document in verifying that training and qualification requirements are verified prior to the start of work?	0/R		Site requirements for training is located in Procedure M-122, "Training Qualification Requirements" and is mandatory for all maintenance personnel.

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ATTACHMENT 4
SITE ANALYSIS – FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Lines of Inquiry	Score	Procedure Locator	Justification / Comments
7) How adequately does the work control document address the roles and responsibilities for those personnel involved?	1	4.0	This is addressed throughout MT-0003 as each step is defined who is responsible for each job element.
8) How well does the work control document address the balance of priorities with respect to safety implications and time?	3	5.1	This document provides an excellent means of addressing the priorities of work, along with the responsible manager necessary to approve the priority work. Only more senior management can make authorization for higher priority work.

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ATTACHMENT 4
SITE ANALYSIS – FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

GENERAL SITE QUESTIONS	
Question	Response
1) How adaptable is this document to other DOE Sites?	Fernald uses the Lotus Notes computer program that can be tailored to any site. However, this may be a difficult process, because the elements within this procedure would be hard to extract without adopting the entire process.
2) How broad of a spectrum does this document cover?	The MT-003 procedure covers corrective maintenance, alterations, fabrication, preventive maintenance and maintenance work tickets.
a) Can this document be used for the following activities?	
• Corrective Maintenance	Yes
• Preventive Maintenance	Yes
• D&D	No
• Operations	No
• Construction	No
• R&D	No
• Environmental Restoration/Remediation	No
• Other (i.e., Services, Surveillances, utilities, Service technicians, etc.) – Specify	No
• Services/Warranty Type Work	No
3) Does this work control document require the support of a CMMS? – Specify Software Used.	The MT-003 procedure is used with two computer programs. Lotus Notes is used for managing and tracking the work orders, for obtaining approvals, and for attaching things (e.g., permits) to the work order. The Fluor Daniel CMMS program provides the modules for parts procurement, equipment inventories, PM scheduling, etc.

ATTACHMENT 4
SITE ANALYSIS – FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

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WORK CONTROL SUMMARY

The Hanford Site consists of multiple facilities managed by six major subcontractors with Fluor Daniel Hanford as the primary integrator. The Waste Management Hanford Maintenance Work Management procedure (WMH-200, Section 3.1) documents the work management process for four functional groups of facilities/complexes including Solid Waste Projects (SWP), Waste Receiving and Packaging Facility (WRAP), 200 Area Liquid Waste Processing Facilities and 222-S Labs/Waste Sampling and Characterization (WSCF) facilities.

The consolidation of these four major programs was first initiated with the development and approval of one Maintenance Implementation Plan, the implementation of a single work management procedure and later with the organization of a central group to support the implementation this program. The most recent revision of the maintenance work management procedure captures the formal implementation of the Automated Job Hazard Analysis (AJHA) tool and further

defines roles, responsibilities and organizational interfaces.

This AJHA tool contains in-depth hazard questions (checklists format). The work planning team uses this tool for hazard analysis, controls and requirements management.

Hazard analysis is performed using a graded approach based on the risk/complexity of the task. Risk level ratings (low, medium and high) are commonly used in the review of radiological work. Specific reference to these risk levels is not as evident in non-rad activities however, the combination of risk and complexity is a strong consideration when balancing the formality of the hazard analysis performed, skill of craft, written instructions and field supervision. Examples of this graded approach are provided below:

- Work-It-Now (WIN) ticket activities require the review of the Person in Charge (PIC) of the task and the assigned worker. The PIC and worker verify that the work is on the list of approved activities and analyze the hazards. Additionally, the worker verifies that the work is within their skill level (skill of the craft). Written

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instructions and supervision are minimal.

- Preventive Maintenance and Surveillance (PM/S) activities receive AJHA screening when new maintenance procedures are developed and when requested by a PIC, craft, etc. Written instructions vary in depth as does the amount of field supervision required.
- Corrective maintenance activities, at a minimum, receive an AJHA pre-screening for risk/complexity with formal AJHA performed when triggered by the pre-screening. Concurrence is required from the worker and PIC when formal AJHA is not required thus accomplishing worker involvement.

Pre-Job Briefings are required on all tasks but are documented using a graded approach.

Employee Job Task Analysis (EJTAs) are developed for all employees. This job task analysis allows for the identification of needed medical surveillance and specialized training requirements (e.g., Radiological, Hazard Waste, etc.).

Training requirements are maintained and outlined separately in the Training Matrix

(TMX) database. TMX reports are reviewed periodically to ensure training is maintained current for all workers.

The Job Control System (JCS) is the computerized maintenance management system (CMMS) used today however Waste Management Hanford is evaluating the possible transition to INDUS PassPort. The JCS system has been used on the Hanford Site since November 1989.

NOTABLE PRACTICES

Integrated Safety Management core functions were specifically addressed in a separate section (Section 5.0) of the procedure; however, the ISM functions have been integrated into the work control process. Supporting technical disciplines (H&S, Rad., environmental, etc.) have been integrated into the procedure, mainly within the Automated Job Hazard Analysis (AJHA) tool. The procedure, other than the AJHA, is generally an expert-based process that covers only the core maintenance functions (corrective and preventive maintenance, modifications, other and services.)

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The notable practice was the Hanford
AJHA for hazards identification and control.
This customized, computer-driven tool uses
smart logic to minimize the effort to identify
hazards (i.e., answer questions only if a
particular hazard is identified.) Supporting
technical disciplines are identified in the

process. This process is an effective way of
promoting (but not mandating) the
formation of diverse teams. Hazard controls
are identified by the program, and selected
to be put into the work instruction by the
planner.

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CONTACT INFORMATION

Work Control Contact:	Address / Phone:
Cheryl Salinas	Waste Management Federal Services of Hanford (WMH) S3-32, P.O. Box 700, Richland, WA (509) 373-7159

PROCEDURE REVIEWED

Procedure Number:	Revision:	Title:	Status:
MH-200 Section 3.1	2	Maintenance Work Management	Approved

GENERAL NOTES & COMMENTS

1. The Maintenance Work Management procedure Section 3.1, and the on-line computer Automated Job Hazardous Analysis (AJHA) procedure, were the two references reviewed. These references covered maintenance and maintenance related construction work at six major Waste Management facilities.
2. The Section 3.1 procedure is a combination of standards based, primarily in the hazards identification and controls areas using the AJHA, and expert based where many judgement decisions are made by responsible managers.
3. The maintenance organization is a hybrid between decentralized maintenance groups at the six major areas and a centralized maintenance supporting group that can be matrixed to the decentralized units.
4. Section 5.0 of the procedure presents the ISM program description. Section 6.0 discusses the work control process.

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ANALYSIS DATA			
Lines of Inquiry	Score	Procedure Locator	Justification / Comments
1) How effective is this work control document in defining the work scope?	1.0		
a) How effective is the document in work identification?	1	3.1-6.2.1	No work control form is given in the procedure, except for Work It Now (WIN) work.
b) How effective is the document in initial work screening?	1	3.1-6.2.2	Pg. 12, work control or operations.
c) How effective is the document in requiring initial work authorization?	1	3.1-6.2.2	Pg. 11
d) How well does this document involve the line management?	1	3.1-2.12, 6.2.4.6	Operations involved in process. WIN ticket plus screening.
e) How effective is the document in applying the graded approach in distinguishing between the various types of work?	1	3.1-App, A Table 2 for WIN 3.1-Figure 2,3,4 3.1-6.2	Appendix A identifies Skill-of-Craft work Work covered only includes all maintenance, construction, and modifications.
2) How effective is this work control document in identifying the hazards?	1.6		
a) How comprehensive is this document in hazard identification?	2	AJHA program Walk-down checklist	AJHA tool is comprehensive
b) To what degree are tools (e.g., computerized, checklists, etc.) used for hazard identification?	2	AJHA program Walk-down checklist	
c) How well is the graded approach used in hazard identification?	2	AJHA 3.1-6.2.3	AJHA checklist uses screening questions to skip sets of questions. Risk and complexity determination for radiation hazards.
d) How well is the graded approach used in forming diverse teams?	2	3.1-6.2.3.5.i AJHA program	Graded approach. Craft participation not mandatory. “Involvement flags” in the AJHA.
e) How effective is this procedure for distinguishing between low, medium and high hazard tasks?	1	3.1-2.13 3.3	Radiological risk review and waste planning reviews. No integration of reviews yet.

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Lines of Inquiry	Score	Procedure Locator	Justification / Comments
f) To what level is the worker involved?	1	3.1-2.11.2 3.1-6.2.3.5.a 3.1-App. A	Craft responsible to participate in planning.
g) To what level are other organizations involved? (consider the following):	1	3.1-2.0, 6.2.4, AJHA	
• Environmental			Yes
• Industrial Hygiene			Yes
• Occupational Safety			Yes (Design Authority)
• Radiological Control			Yes
• Engineering			Yes
• Quality Assurance/Control			Yes
• Facility/Operations/Departmental Personnel			Yes
• Fire Protection			Yes-6.2.4
• Criticality Safety			Yes
• Nuclear Safety			Yes
• Waste Management			Yes, Figure 6
3) How effective is this work control document in identifying and incorporating the hazard controls in the work instructions?	1.3		
a) How comprehensive is this document in identifying the appropriate hazard controls based on the hazards identified?	2	AJHA program, Walk-down form	
b) How effective (ease of use, probability of use) is this document in identifying the appropriate hazard controls based on the hazards identified?	2	AJHA program	AJHA program provides cross-walk from identified hazard to applicable control.

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Lines of Inquiry	Score	Procedure Locator	Justification / Comments
c) How effective is this document in incorporating the hazard controls into the appropriate work document?	1	3.1-6.2.3.5.k	Lists all SME's responsibility.
d) How well does this document apply the graded approach concept in the planning and preparation of work documents (i.e., is this document flexible in format and content based on the application)?	1	3.1-6.2.3.5.g and k.	Expert based system which allows a lot of flexibility on what is included.
e) How well are lessons-learned and feedback incorporated into the planning process?	1	3.1-6.2.3.5.g	Pg. 15
f) How well does the document address "skill-of-craft" principles into the development of the work documents?	1	3.1-Fig. 2, 5, Table 2, App. A	
g) g) How well does this document implement engineering design changes?	1/R	3.1-App. B 3.1-6.2.3.4, 3.1-6.2.8.6	Reference is HNF-PRO-440 Modification work only
h) h) To what level is the worker involved?	1	3.1-6.2.3.5.a and i 3.1-App. A	General references only
4) How effective is this work control document in the work performance?	1.0		
a) How effective is this document in material requisitioning and procurement?	1	3.1-2.7, App. H	2.7-Material coordinators App. H-standard requisition process
b) How effective is this document in ensuring adequate work authorization (to include work document review, approval, and work release)?	1	3.1-6.2.4, 6.2.5, 6.2.7	
c) How effective is this document in work scheduling?	1	3.1-2.6, Fig. 4 3.1-6.2.6, 6.2.7	
d) How effective does this document address pre-job briefings?	1	3.1-6.2.8.3 Pre-start Eval. Form	
e) How effective does this document address work execution instructions?	1	3.1-6.2.8	

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Lines of Inquiry	Score	Procedure Locator	Justification / Comments
f) How effective and flexible is this document in addressing document revisions and field changes?	1	3.1-App. F 3.1-2.2.3, 2.9, 3.1-2.8.5.a. and b.	Good control of PM changes. Good approval guidance. Design authority responsibilities
g) How effective is this document in addressing post-performance testing and acceptance?	1	HNF-PRO-440 3.1-6.2.3.5.1	Engineering Document Change Control
5) How effective is this work control document in soliciting feedback?	1.0		
a) How effective is this process in ensuring adequate close-out of the work documents?	1	3.1-6.2.9	
b) How well does the document solicit/input feedback?	1	3.1-2.10, App. E, 3.1-6.2.8.8, 6.2.9.1, Post Job Review	PIC does post job review per graded approach. App. E-10.0 for PM's Review Form solicits feedback
c) Does this document provide an avenue to obtaining feedback (e.g., does this process describe a post-job review approach)?	1	3.1-6.2.8.8, 6.2.9 Post Job Review	Review Form solicits feedback
d) How flexible and user-friendly is this feedback system?	1	3.1-6.2.9 Post Job Review	Form solicits Lesson Learned and comments
6) How effective is the work control document in addressing the training and qualification requirements?	1.0		
a) How effective is the work control document in identifying job unique training and qualification requirements?	1/R	EJTA and TMX AJHA and Pre-start Evaluation Form	Employee Job Task Analysis and Training Matrix data base are referenced.
b) How effective is the work control document in verifying that training and qualification requirements are verified prior to the start of work?	1	Pre-start Evaluation Form	Question #3
7) How adequately does the work control document address the roles and responsibilities for those personnel involved?	1	3.1-2.0 and in procedure steps	In each section, lists responsibilities by person.
8) How well does the work control document address the balance of priorities with respect to safety implications and time?	1	3.1-Table 1, pg 35	

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GENERAL SITE QUESTIONS	
Question	Response
1) How adaptable is this document to other DOE Sites?	Adaptable for maintenance work control. Generic requirements requiring judgement decisions from responsible person.
2) How broad of a spectrum does this document cover?	Limited.
a) Can this document be used for the following activities?	
• Corrective Maintenance	Yes
• Preventive Maintenance	Yes
• D&D	No
• Operations	No
• Construction	Modifications only (see WMH-200, Section 3.5 procedure)
• R&D	No
• Environmental Restoration/Remediation	No
• Other (i.e., Services, Surveillances, utilities, Service technicians, etc.) – Specify	Yes
• Services/Warranty Type Work	Yes
3) Does this work control document require the support of a CMMS? – Specify Software Used.	The JCS CMMS is used for work order management.

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ATTACHMENT 6
SITE ANALYSIS – INEEL

WORK CONTROL SUMMARY

During October 1998 the Site Operations Director commissioned the development and implementation of a Maintenance Integrated Work Control Process (IWCP) manual to consistently implement a Site-wide standardized process consistent with principles of ISMS. The IWCP is modeled after the Rocky Flats process. This IWCP provides a foundation for management to identify and communicate standards, requirements, and expectations to employees involved in performing maintenance and construction work at the INEEL. It also significantly increases the use and effectiveness of the Hazard Identification and Mitigation Process.

Several gaps existed in the Maintenance Program where the ISMS elements and principles were not yet fully implemented. For example, there was not a consistent integrated process utilizing a standardized graded approach to identify hazards and risks and to establish and apply safety controls. Standardized processes, tools, or methods to integrate ES&H into hazard analyses and controls across the INEEL

were not fully effective. Safety controls sometimes were contradictory.

On July 28, 1998, a fatality occurred at the Test Reactor Area. The resulting Class A Accident investigation and other related assessments identified the need to further strengthen the INEEL Maintenance Program. The resulting corrective actions required several improvements to the Maintenance Program. These include: 1) assure that safety basis documentation and procedures for inactive facilities are updated, maintained, and appropriately used; 2) expedite the implementation of integrated ES&H management policy including the accelerated application of core functions to all work activities on site; 3) train the work force and ES&H professionals on principles and application of ISMS into all phases of work planning and control; 4) provide additional guidance on the performance of hazard analyses to include the importance of capturing all potential and credible hazards associated with the work or workspace and the significance of risks created by the hazards; and 5) provide additional management attention to assure the effectiveness of the work control system to include direct involvement of

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knowledgeable managers in reviewing work and coaching individuals on system implementation.

The Maintenance IWCP manual provides "One Stop Shopping" for personnel involved in the work control process (covering safety, ISMS elements, VPP attributes, facility authorization basis guidelines, EWP principles, etc.). Among other things it defines the work control process, delineates responsibilities, and establishes relationships between operations, maintenance, and support organizations.

This manual also ensures adequate guidance for performing hazard analyses and stresses the importance of capturing all potential and credible hazards for both the work and the surrounding area. LMITCO also developed and instituted a training program for those involved in the work control process.

Final implementation occurred in April 1999. Initial feedback and observations have identified several benefits as a result of implementing the new Maintenance ICWP. These include: 1) the Facilities Hazards List database is available to all INEEL personnel to allow them to determine the hazards present in an area they plan to enter; 2) maintenance and construction crafts work to

the same standards; 3) the intensive training to implement the program improved the effective implementation of ISMS and VPP; 4) The Maintenance Managers have developed a strong working rapport that will benefit any future Site-wide maintenance coordination activities; 5) the flowdown of requirements into the Maintenance Program is thoroughly identified and implemented; and 6) all personnel working within or supporting construction and maintenance activities have clearly defined roles and responsibilities.

Where LMITCO has learned from using models that implemented ISMS at other DOE facilities, those lessons learned and improvements to processes made at the INEEL may now serve as a model for other DOE facilities. LMITCO now uses a standards-based approach to identify, mitigate, and control hazards. Additionally, several state-of-the-art technologies have been implemented have automate the LMITCO IWCP via use of the Internet.

NOTABLE PRACTICES

The Idaho National Engineering and Environmental Laboratory (INEEL) work control procedure was a draft procedure

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expected to be implemented at INEEL in April or May, 1999. This procedure is a total re-write of the INEEL work control system, and will apply to all organizations at the site. The procedure totally integrates the core Integrated Safety Management functions into the INEEL work control process. In this respect, INEEL's procedure is a model for other DOE sites. The INEEL procedure is the single site procedure for work control, but has many references to other procedures were made, such as engineering, materials, etc. The INEEL procedure is limited, however, in that it covers only basic maintenance (corrective and preventive maintenance, modifications and services) work activities. The INEEL procedure tends towards a standards-based process compared to most other procedures, which were expert-based. Much of the volume in INEEL's procedure can be attributed to this. Participation by all technical disciplines (H&S, Rad., environmental, etc.) through the Job Hazards Analysis (JHA) process is encouraged, but not mandated. The work control process is supported by, but not dependent on, the PassPort computerized maintenance management system.

Notable practices included initial work screening, inquiring about lessons learned in the planning phase, identification of training requirements in the hazard control instructions, and a work control priority system. The initial work screening process identified certain types of work (routine maintenance, emergency maintenance, preventive maintenance) sending such identified work directly to a specific set of work control procedures thereby streamlining the process to some degree. Triggers were included in the work control procedure for planners to query lessons learned data bases. Hazard controls included, not only a description of the control, but also a list of training requirements for the worker which are then incorporated into the work instruction. The work control prioritization process is a logical breakout of priorities where line management approves the priority. Lastly, INEEL takes a different approach to work that can be accomplished by skill-of-the-craft. Craft skills become the criteria as to whether a job can be done as skill-of-the-craft, not what skills the job requires (i.e., the skills of the craft person determine if the job gets done by skill-of-the-craft.

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Outstanding notable practices included a graded approach process in distinguishing between the types of work, a comprehensive hazards identification and controls process, and a unique approach to skill-of-the-craft work. Graded approach applications are found throughout the INEEL work control procedures. One graded approach application of particular note is the analyses of type of work that result in work control process requirements which are effectively

tailored to the specific type of work. The Hazards Profile Screening Checklist (HPSC) also screens out not-applicable requirements. The Hazards Identification and Mitigation (HIM) process truly is comprehensive and a model because of its completeness, its promotion of diverse teams, and the differentiation of planning rigor required. The drawback is the effort (resources) needed to complete the procedure.

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SITE INFORMATION

Work Control Contact:	Address / Phone:
Larry Chigbrow	LMITCO, P.O. Box 1625, Idaho Falls, ID 83415-4131 (208) 526-3188

PROCEDURE REVIEWED

Procedure Number:	Revision:	Title:	Status:
STD-101	Draft D	Integrated Work Control Process	

GENERAL NOTES & COMMENTS

1. Overall this document provided a comprehensive approach to work control and ensured that all essential elements of ISMS were incorporated in the necessary places. The size is somewhat intimidating however.
2. The document reviewed was in draft form, and may be revised before issuing for implementation.
3. Procedure covers only maintenance and construction type work.
4. There are many hand-offs to other references (procedures).
5. There are references to interface with a computer system (PASSPORT), but work control can be completed without computer support.
6. This work control procedure can be used as a model for numerous ISMS elements and work control activities. In those cases, the information is comprehensive, and can be used as a reference to work from.
7. Training requirements, i.e., classes available and those required to attend, were notable.

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ANALYSIS DATA			
Lines of Inquiry	Score	Procedure Locator	Justification / Comments
1) How effective is this work control document in defining the work scope?	1.6		
a) How effective is the document in work identification?	1	Chap.2, 5.2.2 WC Form, App.2.1	
b) How effective is the document in initial work screening?	2	Chap.2, 5.2.2 WC Form, Sect. 1	
c) How effective is the document in requiring initial work authorization?	1	Chap. 2, 5.2.2	Operations person reviews for authorization. Supervisors listed specifically.
d) How well does this document involve the line management?	1	Chap. 2	This manual is based on the reviews and determinations made by the line manager for the applicable activity.
e) How effective is the document in applying the graded approach in distinguishing between the various types of work?	3	Chap. 2,	Flow diagram, Appendix 1-1, pg. 79, HPSC Checklist
2) How effective is this work control document in identifying the hazards?	2.3		
a) How comprehensive is this document in hazard identification?	3	Chap 2, App. 2-2 Chap 3, App. 3-4	HPSC, Walk-down checklist. Computer applications in development.
b) To what degree are tools (e.g., computerized, checklists, etc.) used for hazard identification?	2	Chap 2, App. 2-2	
c) How well is the graded approach used in hazard identification?	2	Chap 2, App. 2-2 and 2-3	
d) How well is the graded approach used in forming diverse teams?	2	Chap 2, App. 2-2 and 2-3	Checklist drives who participates. Guidance given on planning levels.
e) How effective is this procedure for distinguishing between low, medium and high hazard tasks?	2	Chap 2, App. 2-2 and 2-3	Minor Maintenance and Maintenance Related Tasks (MRT), and Emergency work not included in these planning levels
f) To what level is the worker involved?	2	Chap 2, App. 2-3	Mandatory participation on all walk-downs.
g) To what level are other organizations involved? (consider the following):	3	Chap 2, App. 2-2 Chap 3, 4.0	All disciplines are covered in Screen 2, Preliminary Hazards Profile

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Lines of Inquiry	Score	Procedure Locator	Justification / Comments
• Environmental			
• Industrial Hygiene			
• Occupational Safety			
• Radiological Control			
• Engineering			
• Quality Assurance/Control		Not listed.	
• Facility/Operations/Departmental Personnel			
• Fire Protection			
• Criticality Safety			
• Nuclear Safety			
• Waste Management			
3) How effective is this work control document in identifying and incorporating the hazard controls in the work instructions?	2.0		
a) How comprehensive is this document in identifying the appropriate hazard controls based on the hazards identified?	3	Chap 3, App. 3-2	Provides training requirements, hazard control permits, drivers for each hazard.
b) How effective (ease of use, probability of use) is this document in identifying the appropriate hazard controls based on the hazards identified?	2	Chap. 2., App. 2-2 Chap 3, App. 3-2	
c) How effective is this document in incorporating the hazard controls into the appropriate work document?	1	Chap 3, Chap 4, Chap 9	Hazard controls are incorporated into Minor Maintenance and Maintenance Related Tasks in Chap 9.

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Lines of Inquiry	Score	Procedure Locator	Justification / Comments
d) How well does this document apply the graded approach concept in the planning and preparation of work documents (i.e., is this document flexible in format and content based on the application)?	2	Chap. 2, 3.0, App. 2-3 Chap 3, 3.0 Chap. 9	Appendix 3.1 gives detail on levels. Appendix 3.5 are very strict requirements. Integrated Hazards Assessment (IHA) is graded approach, lists tools and techniques.
e) How well are lessons-learned and feedback incorporated into the planning process?	2	Chap 3, Chap 2, Fig. 2-1	See Work Flow Diagram, App. 1-1, pg. 79
f) How well does the document address “skill-of-craft” principles into the development of the work documents?	3*	Chap 7	* INEEL’s approach is to list skill-of-the-craft by Class Levels, in contrast to listing generic jobs which can be performed by skill-of-the-craft instructions. No evaluation is made as to which approach is preferable.
g) How well does this document implement engineering design changes?	1	Chap 4, 3.7 Chap 5, pg. 227	
h) To what level is the worker involved?	2		Worker participation is mandatory.
4) How effective is this work control document in the work performance?	1.0		
a) How effective is this document in material requisitioning and procurement?	1	Chap 4, App. 4-4 and 4-5	References other procedures to use. Covers equivalencies, hazardous materials.
b) How effective is this document in ensuring adequate work authorization (to include work document review, approval, and work release)?	1	Chap 9, Chap 4, Section I.O	Chap 9 for Minor Maintenance (MM) and Maintenance Related Task (MRT).
c) How effective is this document in work scheduling?	1	Chap 9 Chap 8, 3.3 Chap 4, 3.4	Required for MM and MRT For Preventive Maintenance and Predictive Maintenance have to be scheduled.
d) How effective does this document address pre-job briefings?	1	Chap 9	Chap 9, required for MM and MRT. Chap 4, 3.2.2 IX refers to MCP-3003.
e) How effective does this document address work execution instructions?	1	Chap 4, 3.6	Gives format only.
f) How effective and flexible is this document in addressing document revisions and field changes?	1	Chap 4, 3.7, App. 4-3	
g) How effective is this document in addressing post-performance testing and acceptance?	1	Chap 9 Chap 4, XI, pg. 202	MM and MRT may submit feedback.

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Lines of Inquiry	Score	Procedure Locator	Justification / Comments
5) How effective is this work control document in soliciting feedback?	1.0		
a) How effective is this process in ensuring adequate close-out of the work documents?	1	Chap 1, 6.0 Chap 4, 3.10	Records management requirements included in STD 101. Complete list. Flow Chart, Chap 1.
b) How well does the document solicit/input feedback?	1	Chap 4, XII, pg. 203	
c) Does this document provide an avenue to obtaining feedback (e.g., does this process describe a post-job review approach)?	1	Chap 4, XII, pg. 203	Type 1 packages only. No forms or examples.
d) How flexible and user-friendly is this feedback system?	1		
6) How effective is the work control document in addressing the training and qualification requirements?	1.5		
a) How effective is the work control document in identifying job unique training and qualification requirements?	2	Chap 7, 4.1 and App. 7-1 and 7-2. Chap 7, 4.0, Note 3 Chap 1, 4.5, 4.7 Chap 1, App. 1-2 Appendix 3.3	Skill-of-craft certification. Chap 4, 3.2.2, pg. 200 Skill-of-craft special training. Qualified planners. Refers to Manual 12, Training and Qualification. Appendix 3.3 provides a more than adequate identification of the training requirements using Appendix 2.2.
b) How effective is the work control document in verifying that training and qualification requirements are verified prior to the start of work?	1	Chap 1, App. 1-2	Responsibilities stated. Reference to all the supporting aids.
7) How adequately does the work control document address the roles and responsibilities for those personnel involved?	1	Chap 1, 4.0	The many different positions are confusing and ambiguous in many cases.
8) How well does the work control document address the balance of priorities with respect to safety implications and time?	2	Chap 2, 5.2.2 Chap 2, Table 2-1 Page 41	WC Form, Section 1 Work Priority Categories

Legend

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ATTACHMENT 6
SITE ANALYSIS – INEEL

GENERAL SITE QUESTIONS	
Question	Response
1) How adaptable is this document to other DOE Sites?	Could be used as a comprehensive model to build DOWN from. The entire work control process can be used in a manual mode. The HPSC may be limited to what site software is available. INEEL uses the PassPort CMMS.
2) How broad of a spectrum does this document cover?	Covers the complete work control process from work initiation to close-out.
a) Can this document be used for the following activities?	Operations, R&D, other and services work not covered.
• Corrective Maintenance	Yes
• Preventive Maintenance	Yes
• D&D	Yes
• Operations	No
• Construction	Yes
• R&D	No
• Environmental Restoration/Remediation	Yes
• Other (i.e., Services, Surveillances, utilities, Service technicians, etc.) – Specify	No
• Services/Warranty Type Work	No
3) Does this work control document require the support of a CMMS? – Specify Software Used.	PASSPORT is used, but not required. Closely tied as to many forms on PASSPORT. All work instruction forms can be prepared manually.

**ATTACHMENT 7
SITE ANALYSIS – LANL**

WORK CONTROL SUMMARY

Los Alamos National Laboratory divides work into two categories; facility work and non-facility- related work. It uses two methodologies to control work as defined by these two categories. These two methodologies are defined as Facility Management Work Control and Safe Work Practices. Both methodologies incorporate the tenets of the Integrated Safety Management (ISM) System. This paper will summarize the Facility Management Work Control methodology.

The Laboratory uses Laboratory Implementation Requirements or LIRs as the vehicle to define Laboratory requirements and their implementation. The two primary, or driving LIRs that define work control requirements are 230-03-01, Facility Management Work Control and 402-10-01, Hazard Analysis and Control for Facility Work. There are ancillary LIRs and LIGs (Laboratory Implementation Guidance).

Facility work is managed via a decentralized, distributed, facility management model. Presently there are

sixteen Facility Management Units (FMUs) responsible for facilities within specific geographical areas of the Laboratory. The laboratory encompasses 46 square miles.

The LIRs define institutional requirements which outline a rather specific process. Some people have characterized these requirements and process as a procedure. It is the responsibility of the individual Facility Managers of the sixteen FMUs to implement the requirements. Some have chosen to write additional FMU specific implementing procedures, others have not, choosing simply to follow the process outlined in the LIRs.

One of the overriding principles of the two driving LIRs is the integration of the five ISM functions:

- define the work,
- identify the hazards,
- mitigate the hazards,
- do the work safely, and
- provide feedback/lessons learned.

Both LIRs very specifically define the roles and responsibilities of the all of the people involved in facility work control. The Facility Management Work Control LIR goes on to outline the requirements for:

ATTACHMENT 7
SITE ANALYSIS – LANL

<ul style="list-style-type: none">• Originating a request for work including the identification of any known site hazards by the originator of the request.• Processing the work request including:<ul style="list-style-type: none">❖ a review of the work requested;❖ characterization of the work including❖ priority,❖ category, and❖ management level (the application of the graded approach);❖ skill of craft determination; and❖ completion of the ES&H Site Hazards and Controls form.• Planning the work including:<ul style="list-style-type: none">❖ assigning of a planning team if appropriate,❖ development of a scope and cost estimate,❖ determining project management method for high value work,❖ preparation of work requirements,❖ approving the work request, and❖ routing the work request to the appropriate work provider.• Executing and control the work including:<ul style="list-style-type: none">❖ developing a work package including:	<ul style="list-style-type: none">❖ very specific required forms (from both LIRs) and❖ any supplemental documentation that would add value to the work package in assisting the worker in the performance of the work;❖ reviewing the work package;❖ scheduling and coordinating the work;❖ releasing or authorizing the work to be performed;❖ a three-tiered change control process for any and all changes;❖ accepting the work; and❖ closing out the work including lessons learned. <ul style="list-style-type: none">• Using a steamed-lined process for accomplishing emergency and urgent work. <p>The Hazard Analysis and Control for Facility Work LIR goes on to further amplify and ensure the integration of safety into every aspect of the process. It outlines the requirements for:</p> <ul style="list-style-type: none">• Identifying and controlling site hazards.• Identifying and controlling task hazards.• The development of an Activity Hazard Analysis which integrates for a specific job the
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**ATTACHMENT 7
SITE ANALYSIS – LANL**

<ul style="list-style-type: none">❖ site hazards and controls,❖ task hazards and controls,❖ any permits required of the job, and❖ any applicable training for the identified hazards and controls. <ul style="list-style-type: none">• Reviewing safety documentation.• Pre-job walkdowns and briefings.• Stopping work when appropriate.	<p>modifications, other and services.) The requirement in both procedures for involvement of supporting technical disciplines (H&S, Rad., environmental, etc.) existed, but was not emphasized.</p> <p>The most notable feature of LANL's Safe Work Practices work control procedure was the application of work control to R&D and laboratory operations activities. LANL has recognized that this is a "work-in progress" to institute work controls, which embody Integrated Safety Management functions and principles, into a traditional non-work control area. A second notable practice, not evaluated by the Team's ISM-slanted criteria, and which was a totally unique LANL, was the inclusion in each of the procedures an assessment criteria for determining when the procedures was implemented. LANL separated out the site policy on Graded Approach in a stand-alone procedure. A third notable practice was the prominent recognition of work participation throughout both of the work control procedures. For example, the first category of people identified in the responsibility section (5.0) of the Safe Work Practices procedure was the worker.</p>
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NOTABLE PRACTICES

The Los Alamos National Laboratory (LANL) work control procedures incorporate and integrate Integrated Safety Management core functions into the procedures. Safe Work Practices, LIR 300-00-02.0, is a good example. The characteristic most obvious of LANL's work control procedures was that they stated program requirements in more general terms resulting in an expert based system. This approach was driven by the de-centralization of operations (16 Facility Management Units) and the diversity in type of work, particularly R&D and laboratory operations. A second, separate work control procedure reviewed covered the maintenance functions (corrective and preventive maintenance,

**ATTACHMENT 7
SITE ANALYSIS – LANL**

CONTACT INFORMATION

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PROCEDURE REVIEWED

Procedure Number:	Revision:	Title:	Status:
Various (See Below)	See Below	See Below	Approved

GENERAL NOTES & COMMENTS

The following procedures were reviewed for this analysis:

- 1) Facility Management Work Control, LIR 230-03-01.4, 3/8/99
- 2) Graded Approach for Facility Work, LIR 230-01-02.2, 9/11/98
- 3) Safe Work Practices, LIR 300-00-01.0, 1/16/98
- 4) Documentation of Safe Work Practices, LIR 300-00-02.0, 8/19/98
- 5) Hazard Analysis and Control for Facility Work, LIR 402-10-01.4, 3/8/99

1. Procedures are written as institutional guidance for the 16 autonomous Facility Management Units (FMU's). Consequently the direction is more generic than specific. FMU's will use more specific implementing procedures as they see fit.
2. Larger project construction work control is covered by a different LIR (Laboratory Implementation Requirement).
3. Procedures are "expert" based. Broader guidelines are given, and the responsible person has to provide the details and add the specifics.
4. Procedures have been re-written to conform to ISM core functions. LIR 300-00-01.0, Safe Work Practices is a good example.
5. LIR 300.00.01.0 starts off with the worker's responsibility.
6. Unique with LANL procedures, is that there is an Attachment for assessing the implementation of the procedure.
7. All procedures were well organized, straight forward and easy to understand. All procedures provided requirements that were more generally stated (major steps) as opposed to a lot of detail. The approach is driven by the need for site-wide procedures that have to cover a wider variety of operations. Descriptions and requirements inclined to the general instead of the specific.
8. Forms were not included in LIR 230.03.01.4 procedure, Facility Management Work Control, but were obtained and distributed for review by the Team.
9. The PassPort CMMS is being implemented. 3 of 16 Facility Management Units (FMU's) have started using PassPort.

ATTACHMENT 7
SITE ANALYSIS – LANL

ANALYSIS DATA			
Lines of Inquiry	Score	Procedure Locator	Justification / Comments
1) How effective is this work control document in defining the work scope?	1.0		
a) How effective is the document in work identification?	1	230-03-01.4 Form 1336	Section 7.1, 7.2 Coordination Review , Work Request Form 1336
b) How effective is the document in initial work screening?	1	230-03-01.4 230-01-02.2	Step 7.2 of 230-03-01.4 provides a complete set of instructions for ensuring the activity is adequately screened before planning commences. The management levels outlined in 230-01-02.2 provide the user with a good method for determining the correct planning method.
c) How effective is the document in requiring initial work authorization?	1	230-03-01.4 Step 7. 3.6 300-00-01.0 Step 7.3.3	
d) How well does this document involve the line management?	1	230-03-01.4 300-00-01.0	This procedure emphasizes the important of the Facility Manager in owning the process. The FM has the overall responsibility for the entire project or activity. Step 7.3.1
e) How effective is the document in applying the graded approach in distinguishing between the various types of work?	1	230-01-02.2	This procedure is used to determine the necessary amount of rigor (i.e., graded approach) which should be applied to each planning activity.
2) How effective is this work control document in identifying the hazards?	1.3		
a) How comprehensive is this document in hazard identification?	1	402-10-01.4	Form 1692 provides an adequate level for the user to identify the applicable hazards.
b) To what degree are tools (e.g., computerized, checklists, etc.) used for hazard identification?	1	402-10-01.4	Forms 1692 (ES&H Site Hazard Control Form), and Form 1694 (Activity Hazard Analysis Form).
c) How well is the graded approach used in hazard identification?	2	402-10-01.4 300-00-01.00	Depends heavily on expertise of SME's Section 8 also depends on experts.

Legend

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ATTACHMENT 7
SITE ANALYSIS – LANL

Lines of Inquiry	Score	Procedure Locator	Justification / Comments
d) How well is the graded approach used in forming diverse teams?	1	230-03-01.4	Step 7.3 – Designation of Planning Team Leader – procedures reviewed stress importance of involving ES&H and workers throughout.
e) How effective is this procedure for distinguishing between low, medium and high hazard tasks?	1	300-00-01.00	8.0 provides a good matrix to help the Line Manager make the correct determination of hazard risk. (NOTE: The SWP LIR deals with non-facility type work. Therefore the line manager is the primary focus and not the FM.)
f) To what level is the worker involved?	2	300-00-01.00 Section 5.1 402-10-01.4 Section 6.2.1	These procedures heavily stress the importance of having the workers involved.
g) To what level are other organizations involved? (consider the following):	1	402-10-01.4 230-03-01.4	This procedures establishes the use of “qualified persons” Who have specific knowledge in these areas (Environmental Industrial Hygiene, Occupational Safety, etc) Step 7.3.4 Encourages use of Subject Matter Experts who have specialized knowledge in these areas
• Environmental		402-10-01.4	4.0 – Qualified Person Definition
• Industrial Hygiene		402-10-01.4	4.0 – Qualified Person Definition
• Occupational Safety		402-10-01.4	4.0 – Qualified Person Definition
• Radiological Control		402-10-01.4	4.0 – Qualified Person Definition
• Engineering			
• Quality Assurance/Control			
• Facility/Operations/Departmental Personnel		402-10-01.4	
• Fire Protection			
• Criticality Safety			

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**ATTACHMENT 7
SITE ANALYSIS – LANL**

Lines of Inquiry	Score	Procedure Locator	Justification / Comments
• Nuclear Safety			
• Waste Management			
3) How effective is this work control document in identifying and incorporating the hazard controls in the work instructions?	1.0		
a) How comprehensive is this document in identifying the appropriate hazard controls based on the hazards identified?	1	402-10-01.4 300-00-01.0 300-00-02.0	These documents provide good direction for the documentation of controls using the Activity Hazard Analysis (Form 1694) described in 402-10-01.4, and the Hazard Control Plan described in 300-00-02.0.
b) How effective (ease of use, probability of use) is this document in identifying the appropriate hazard controls based on the hazards identified?	1	402-10-01.4 300-00-02.0	Attachment 2 has some controls. Depends on expertise of SME's
c) How effective is this document in incorporating the hazard controls into the appropriate work document?	1	402-10-01.4 300-00-02.0	6.2.2.3-General guidelines, form 1694 provides specific controls for the activity Hazard Control Plan, 5.0 for Operations
d) How well does this document apply the graded approach concept in the planning and preparation of work documents (i.e., is this document flexible in format and content based on the application)?	1	230-03-01.4 230-01-02.2	
e) How well are lessons-learned and feedback incorporated into the planning process?	0		
f) How well does the document address "skill-of-craft" principles into the development of the work documents?	1	230-03-01.4	Step 7.2.3 provides a good definition for Skill of Craft type work.
g) How well does this document implement engineering design changes?	1/R	230-03-01.4	References LIR 240-01-01; step 7.4.8 refers to configuration management process
h) To what level is the worker involved?	2	300-00-01.00 Section 5.1 402-10-01.4 Section 6.2.1	These procedures heavily stress the importance of having the workers involved.

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**ATTACHMENT 7
SITE ANALYSIS – LANL**

Lines of Inquiry	Score	Procedure Locator	Justification / Comments
4) How effective is this work control document in the work performance?	1.1		
a) How effective is this document in material requisitioning and procurement?	1		
b) How effective is this document in ensuring adequate work authorization (to include work document review, approval, and work release)?	2	230-03-01.4 300-00-01.00	Section 7.3.5, 7.4.4, 7.4.5 Section 7.3.3 – Authorization for Work & Worker.
c) How effective is this document in work scheduling?	1	230-03-01.4	Step 7.4.4 addresses work scheduling.
d) How effective does this document address pre-job briefings?	1	230-03-01.4 Form FMWC 4	Section 7.4.2.
e) How effective does this document address work execution instructions?	1	230-03-01.4	Step 7.4.6
f) How effective and flexible is this document in addressing document revisions and field changes?	1	230-03-01.4	Step 7.4.6
g) How effective is this document in addressing post-performance testing and acceptance?	1	230-03-01.4	Step 7.4.7
5) How effective is this work control document in soliciting feedback?	1.0		
a) How effective is this process in ensuring adequate close-out of the work documents?	1	230-03-01.4	Step 7.4.8
b) How well does the document solicit/input feedback?	1	230-03-01.4 300-00-01.00	Step 7.4.8, and Form FMWC 3 (Work Documentation Form). 300-00-01.00 Section 7.5.
c) Does this document provide an avenue to obtaining feedback (e.g., does this process describe a post-job review approach)?	1	230-03-01.4	Form FMWC 1 & 3
d) How flexible and user-friendly is this feedback system?	1		
6) How effective is the work control document in addressing the training and qualification requirements?	1.0		

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ATTACHMENT 7
SITE ANALYSIS – LANL

Lines of Inquiry	Score	Procedure Locator	Justification / Comments
a) How effective is the work control document in identifying job unique training and qualification requirements?	1	402-10-01.4	Step 6.2.2.5, and Form 1694 (AHA)
b) How effective is the work control document in verifying that training and qualification requirements are verified prior to the start of work?	1	230-03-01.4 Form FMWC 4	Pre-Job checklist, questions # 6-8.
7) How adequately does the work control document address the roles and responsibilities for those personnel involved?	1.0	402-10-01.4 300-00-01.0 230.03.01.4	Section 7.5 Section 5.1 Section 5.0
8) How well does the work control document address the balance of priorities with respect to safety implications and time?	1.0	230.03.01.4	Attachment 9.2, straight forward priority list.

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ATTACHMENT 7
SITE ANALYSIS – LANL

GENERAL SITE QUESTIONS			
Question		Response	
1) How adaptable is this document to other DOE Sites?		Yes – Requirements are very generally stated.	
2) How broad of a spectrum does this document cover?			
a) Can this document be used for the following activities?		LIR402-10-01.4	LIR300-00-02 LIR 230-03-01.4
• Corrective Maintenance		Y	N Y
• Preventive Maintenance		Y	N Y
• D&D		Y	N N
• Operations		N	Y N
• Construction		Y	N Y
• R&D		N	Y N
• Environmental Restoration/Remediation		Y	N N
• Other (i.e., Services, Surveillances, utilities, Service technicians, etc.) – Specify		N	N Y
• Services/Warranty Type Work		N	N Y
3) Does this work control document require the support of a CMMS? – Specify Software Used.		In process of implementing PassPort.	

ATTACHMENT 8
SITE ANALYSIS – OAK RIDGE (Y-12)

WORK CONTROL SUMMARY

The FMO work control process is a formal, controlled process from start to finish and is applied through a consistent graded approach strategy that begins with the customer identifying a need for maintenance services and initiating an maintenance job request, to closing out the maintenance job package.

After identifying a need for a maintenance job, a maintenance job request is initiated and a very detailed hazard identification process (walkdown included with workers) is performed, which brings in the “right” people for a concurrent review of the job requested. This review is lead by the customer and utilized in job hazard analysis preparation and planning of the job package.

When job priority is established with the customer, the planner begins a very involved planning process which begins with evaluating the job, using the hazard identification data in writing work instructions, and determining the task resources such as identifying necessary tools, equipment, materials and man-hours required to perform the job. A screen and possible review for labor standards (Davis-

Bacon) applicability is performed.

Configuration changes are evaluated during the planning process with USQD’s and configuration change requests prepared as required. The post-maintenance test is prepared and performed per Plant procedure. The job package is reviewed and accepted by the maintenance supervisor, usually with an informal worker review.

When the maintenance job is “planned” with all permits identified, or in place, the job is placed on the weekly schedule as ready to work. The weekly schedule consists of jobs that the customer and FMO have agreed to support and execute at a given time. This is a binding schedule, with manpower, equipment and support groups committed

The execution of the job involves pre and post job briefs, review of job hazard analyses, and communication with appropriate personnel and execution of the maintenance job package.

After the job is complete, the package is returned to the planner for a review of completeness, data entry, lessons learned identification, suggestions, from workers, for improvement in job execution and filing.

ATTACHMENT 8
SITE ANALYSIS – OAK RIDGE (Y-12)

The FMO work control process relies greatly on worker involvement and communication with the customer and all involved in the preparation and execution of a maintenance job package.

NOTABLE PRACTICES

The Oak Ridge Y-12 Plant work control related procedures have incorporated the core functions and principles of Integrated Safety Management. The Oak Ridge Y-12 architecture for procedures is to have a procedure for each activity of work control (i.e., scheduling, close the job, job hazards analysis, etc.) Consequently Oak Ridge Y-12 has many procedures. The Oak Ridge Y-12 procedures addressed only corrective and preventative maintenance activities, so they

were narrow in scope in that regards. The Oak Ridge Y-12 procedures involved all the technical support disciplines in the job planning process. The Oak Ridge Y-12 procedures had the most “middle of the road” approach between being expert-based and standards-based.

Oak Ridge Y-12 was notable for having the highest average quality, across-the-board set of criteria ratings. No practices were in the outstanding notable practice category, but the Team rated a significant number of the Oak Ridge criteria as a notable practice. These included initial screening, prioritization, hazards identification use of graded approach, divers teams, work planning instructions, scheduling, changes, and closeout.

ATTACHMENT 8
SITE ANALYSIS – OAK RIDGE (Y-12)

CONTACT INFORMATION

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PROCEDURE REVIEWED

Procedure Number: Various (See Below)	Revision: See Below	Title: See Below	Status: Approved
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GENERAL NOTES & COMMENTS

The Following Procedures were reviewed for this analysis:

- 1) Y10-35-003, Scheduling Maintenance Jobs, 9/14/98
- 2) Y10-35-006, Completing Maintenance Jobs, 10/26/98
- 3) Y10-35-008, Planner's Guide, 10/26/98
- 4) Y10-35-009, Maintenance Supervisor's Work Control Guide, 10/16/98
- 5) Y10-012, Hazard Identification Planning for Maintenance and New Work Tasks, 6/30/98
- 6) Y73-043, Job Hazard Analysis, 12/18/98

These procedures provide a comprehensive look at the Oak Ridge Y-12 maintenance program. These procedures flow well with one another, and follow the ISMS principles effectively. These procedures are easy to understand and provide many notable practices, specifically in the areas of work screening, and hazard identification and controls. The scheduling of maintenance was also observed as a notable practice.

Procedures were in general user-friendly and easy to read and comprehend. Oak Ridge writes procedures for each step or phase in the work control process. Consequently, there are several procedures referenced. For example, procedure Y10-012 covers the hazard identification process, whereas procedure Y73-043 covers the hazard controls process.

ATTACHMENT 8
SITE ANALYSIS – OAK RIDGE (Y-12)

ANALYSIS DATA			
Lines of Inquiry	Score	Procedure Locator	Justification / Comments
1) How effective is this work control document in defining the work scope?	1.6		
a) How effective is the document in work identification?	1	Y10-012 Appendix B	Appendix B, Electronic Maintenance Job request provides the user with an easy method for identifying an activity or task.
b) How effective is the document in initial work screening?	2	Y10-012 Appendix C, D, E	Appendix C, Health & Safety Hazards Identification, Appendix D, Detailed Screening Questions, and Appendix E, Final Job Grade, provide an excellent mechanism by which activities are screened to determine the appropriate planning level, along with the involvement of associated personnel.
c) How effective is the document in requiring initial work authorization?	1	Y10-012 Appendix E	Appendix E is reviewed and approved by the Operations Line Management, the Maintenance Supervisor, and the Maintenance Planner.
d) How well does this document involve the line management?	2	Y10-012	Line management approves Final Job Grade, and is involved in the Hazard Identification and Screening process, Appendix C, D, and E.
e) How effective is the document in applying the graded approach in distinguishing between the various types of work?	2	Y10-012 Y73-043 Y10-35-008	Y10-012 Appendix C, Health & Safety Hazards Identification, Appendix D, Detailed Screening Questions, and Appendix E, Final Job Grade, provide an excellent mechanism by which the graded approach is applied to the rigor necessary for the type of planning. Y10-35-008 distinguishes between three distinctive types of maintenance: Skill of Craft; Minor Maintenance; and Planned Maintenance. Procedure Y10-012 and Y73-043 apply to all types of work, whereby the other procedures reviewed only apply to maintenance.
2) How effective is this work control document in identifying the hazards?	1.7		

Legend

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ATTACHMENT 8
SITE ANALYSIS – OAK RIDGE (Y-12)

Lines of Inquiry	Score	Procedure Locator	Justification / Comments
a) How comprehensive is this document in hazard identification?	2	Y10-012 Appendix C, D	Appendix C, Health & Safety Hazards Identification, and Appendix D, Detailed Screening Questions, provide an excellent mechanism by which hazards are identified and categorized.
b) To what degree are tools (e.g., computerized, checklists, etc.) used for hazard identification?	2	Y10-012 Appendix C, D	Appendix C, Health & Safety Hazards Identification, and Appendix D, Detailed Screening Questions, provide the user with a comprehensive, user friendly tool for identifying hazards.
c) How well is the graded approach used in hazard identification?	1	Y10-012	Checklists break out different areas (Appendix C & D). Final Job Grade process (Appendix E)
d) How well is the graded approach used in forming diverse teams?	2	Y10-012 Appendix C, D Y73-034 Appendix B & C Y10-35-008 Appendix I	Appendix C, Health & Safety Hazards Identification, and Appendix D, Detailed Screening Questions, provide the user with a list of involved team members as determined by Line Management. Member selection is based on judgement of person filling out form (i.e., expert-based).
e) How effective is this procedure for distinguishing between low, medium and high hazard tasks?	1	Y10-012 Appendix E	Although this procedure doesn't categorize their hazards as either low, medium, or high, Appendix E, Final Job Grade, is used by the Operations Safety Board Team to determine the appropriate Grade based on the hazards identified.
f) To what level is the worker involved?	2	All	Worker involved throughout process, but not mandatory.
g) To what level are other organizations involved? (consider the following):	2	Y10-012 Appendix C, D	
• Environmental		Y10-012 Appendix C, D	Included
• Industrial Hygiene		Y10-012 Appendix C, D	Included
• Occupational Safety		Y10-012 Appendix C, D	Included
• Radiological Control		Y10-012 Appendix C, D	Included

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ATTACHMENT 8
SITE ANALYSIS – OAK RIDGE (Y-12)

Lines of Inquiry	Score	Procedure Locator	Justification / Comments
• Engineering		Y10-012 Appendix C, D	Included
• Quality Assurance/Control		Y10-012 Appendix C, D	Included
• Facility/Operations/Departmental Personnel		Y10-012 Appendix C, D	Included
• Fire Protection		Y10-012 Appendix C, D	Included
• Criticality Safety		Y10-012 Appendix C, D	Included
• Nuclear Safety			Same organization as criticality safety.
• Waste Management		Y10-012 Appendix C, D	Included
3) How effective is this work control document in identifying and incorporating the hazard controls in the work instructions?	1.1		
a) How comprehensive is this document in identifying the appropriate hazard controls based on the hazards identified?	1	Y73-043	This procedure provides a good foundation for determining the hazard controls associated with the task/activity. Appendix C is used as a guide to identify the necessary controls.
b) How effective (ease of use, probability of use) is this document in identifying the appropriate hazard controls based on the hazards identified?	1	Y73-043	This procedure provides a good foundation for determining the hazard controls associated with the task/activity. Appendix C is used as a guide to identify the necessary controls.
c) How effective is this document in incorporating the hazard controls into the appropriate work document?	2	Y10-35-008 Appendix D	This appendix provides the user with the appropriate level of detail to ensure the other procedures' (Y10-012 and Y73-043) results are incorporated into the job planning.
d) How well does this document apply the graded approach concept in the planning and preparation of work documents (i.e., is this document flexible in format and content based on the application)?	1	Y10-35-008 Appendix B, C, D	These appendixes distinguish between three distinctive types of maintenance: Skill of Craft; Minor Maintenance; and Planned Maintenance

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ATTACHMENT 8
SITE ANALYSIS – OAK RIDGE (Y-12)

Lines of Inquiry	Score	Procedure Locator	Justification / Comments
e) How well are lessons-learned and feedback incorporated into the planning process?	1	Y10-35-008 VIII, B.2.m	
f) How well does the document address “skill-of-craft” principles into the development of the work documents?	1	Y10-35-008 Appendix B	This appendix is used specifically for Skill-of-Craft type work, and it specifically defines what Skill-of-Craft work is.
g) How well does this document implement engineering design changes?	R	Y10-187	
h) To what level is the worker involved?	1	Y10-35-008	Involved throughout process.
4) How effective is this work control document in the work performance?	1.6		
a) How effective is this document in material requisitioning and procurement?	1	Y10-35-008 Appendix D	
b) How effective is this document in ensuring adequate work authorization (to include work document review, approval, and work release)?	1	Y10-35-008 Y10-35-009 Y10-35-003	These procedures ensure the work is adequately authorized once the job is planned, ready for scheduling, and prior to performing.
c) How effective is this document in work scheduling?	2	Y10-35-003	This procedure provides a comprehensive look at scheduling maintenance activities, while providing the necessary graded approach.
d) How effective does this document address pre-job briefings?	1	Y10-35-009 VII, C	
e) How effective does this document address work execution instructions?	2	Y10-35-008 Appendix D Y10-35-009	The procedures provide excellent guidance on the development and execution of work steps, and ensure the JHA controls are incorporated into the steps.
f) How effective and flexible is this document in addressing document revisions and field changes?	2	Y10-35-008 Appendix D & G	Provides the user with an easy mechanism to incorporate changes in the field without slowing down production.
g) How effective is this document in addressing post-performance testing and acceptance?	2	Y10-35-008 Appendix E	This appendix provides a comprehensive method for determining the post maintenance testing methodology. It also provides a concise, user friendly data sheet for documenting the PMT completed.
5) How effective is this work control document in soliciting feedback?	1.3		

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ATTACHMENT 8
SITE ANALYSIS – OAK RIDGE (Y-12)

Lines of Inquiry	Score	Procedure Locator	Justification / Comments
a) How effective is this process in ensuring adequate close-out of the work documents?	2	Y10-35-006	This procedure is specifically designed to ensure a work document is adequately closed out. This procedure is user friendly, and provides excellent detail to ensure all areas are covered.
b) How well does the document solicit/input feedback?	1	Y10-35-009 (VII, J.7) Y10-35-006 (VII, A)	
c) Does this document provide an avenue to obtaining feedback (e.g., does this process describe a post-job review approach)?	1	Y10-35-006 VII, A	This procedure provides an adequate mechanism for conducting a post-job review, and focuses on both the positive and negative aspects encountered during the course of the job.
d) How flexible and user-friendly is this feedback system?	1	Y10-35-006	
6) How effective is the work control document in addressing the training and qualification requirements?	R	Y10-027	
a) How effective is the work control document in identifying job unique training and qualification requirements?	R	Y73-043	Although this procedure does not list the specific training requirements, it does reference the user to Y10-027 (Conduct of Training).
b) How effective is the work control document in verifying that training and qualification requirements are verified prior to the start of work?	R	Y10-027	
7) How adequately does the work control document address the roles and responsibilities for those personnel involved?	1	All	All procedures reviewed provide the user with a comprehensive list of personnel responsibilities along with tying these to the specific action steps.
8) How well does the work control document address the balance of priorities with respect to safety implications and time?	2	Y10-35-003	Through the use of Job Grading and priorities, the user is able to obtain an excellent means of identifying the appropriate priority.

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ATTACHMENT 8
SITE ANALYSIS – OAK RIDGE (Y-12)

GENERAL SITE QUESTIONS	
Question	Response
1) How adaptable is this document to other DOE Sites?	The procedures reviewed are clear, concise, and easy to understand, and therefore should be relatively easy to adapt to other sites.
2) How broad of a spectrum does this document cover?	
a) Can this document be used for the following activities?	
• Corrective Maintenance	Yes
• Preventive Maintenance	Yes
• D&D	No (Y10-012 & Y73-043 Can)
• Operations	No (Y10-012 & Y73-043 Can)
• Construction	No (Y10-012 & Y73-043 Can)
• R&D	No (Y10-012 & Y73-043 Can)
• Environmental Restoration/Remediation	No (Y10-012 & Y73-043 Can)
• Other (i.e., Services, Surveillances, utilities, Service technicians, etc.) – Specify	No (Y10-012 & Y73-043 Can)
• Services/Warranty Type Work	No (Y10-012 & Y73-043 Can)
3) Does this work control document require the support of a CMMS? – Specify Software Used.	None noted

ATTACHMENT 8
SITE ANALYSIS – OAK RIDGE (Y-12)

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ATTACHMENT 9
SITE ANALYSIS – RFETS

WORK CONTROL SUMMARY

The Rocky Flats Environmental Technology Site (RFETS) Integrated Work Control Program (IWCP) Manual is used to implement Integrated Safety Management (ISM) and provides detailed guidance on how the five steps of ISM are to be conducted at Rocky Flats. This manual:

- Identifies the specific regulatory requirements for work activities (other programs such as Safety & Industrial Hygiene and Nuclear Safety have requirements that must be integrated into the process controls of this manual, but these are not duplicated in this manual)
- Provides a chapter summary for selection of the proper tools depending on the work activity work scope
- Describes methods and controls to identify an activity
- Describes methods and controls to screen an activity or project for the purpose of identifying the proper level of planning
- Describes methods and the controls for the selected planning method to identify the hazards, develop the specific activity

controls, and implement the specific activity controls

- Describes methods and the controls to select and use the appropriate vehicle for establishing the work implementing methodology
- Describes methods and the controls for developing operations and technical activity procedures
- Describes methods and controls to perform preventive maintenance operations, emergency work, and minor maintenance
- Provides a mechanism for feedback to ensure continuous improvement through the use of a Post Job Review (PJR)

The RFETS IWCP is the single method by which ISM is implemented at the task level . It provides a single process through which **all** work at RFETS is performed. It ensures that the work is screened consistently to uniform criteria and that hazards are appropriately analyzed and controlled. IWCP was developed as the primary mechanism of institutionalizing ISM into the work planning, management, execution, and control processes at RFETS. The IWCP establishes requirements and process controls for **all** work planned at RFETS. All

ATTACHMENT 9
SITE ANALYSIS – RFETS

maintenance, modifications, deactivation, decommissioning/demolition (D&D), remediation, operational activities requiring procedures, and construction work is performed under the IWCP.

Administratively, the IWCP consolidated 15 different work control documents into one central work management manual. This is the only one of its kind across the DOE complex.

NOTABLE PRACTICES

Rocky Flats Environmental Technology Site (RFETS) had a single work control procedure that covers all types of work done at the site. This procedure has been written in such a way that the work control process is structured within the sequence of the five core functions of Integrated Safety Management and fully incorporates the functions and principles of Integrated Safety Management. RFETS was the best example of integration of Integrated Safety Management into a work control system. The RFETS procedure was also unique among the other DOE site reviewed in that all types of work (maintenance, construction, operations, environmental restoration and mediation, service and other)

were covered under the one procedure.

RFETS no longer does R&D work. The RFETS procedure was the best example of a work control system that tended to be more standards-based than expert-based.

Participation by all technical disciplines (H&S, Rad., environmental, etc.) was mandated when respective hazards were identified.

Notable practices included initial job screening and authorization, prioritizing, worker involvement, lessons learned screening, work authorization and feedback. Line management performs the initial screening, authorization and setting the priority. Requirements for the worker to participate in the job walkdown, hazards identification, and work instruction approval is mandatory in most cases. Hazard controls are driven by the hazard identified as a result of the job hazards analysis process. Work authorization requires concurrence by each technical support discipline identified in the hazards identification step prior to approval by line management. Lessons learned screening and feedback requirements are included in the planning phase.

The outstanding notable practices included application of the graded approach, hazards

ATTACHMENT 9
SITE ANALYSIS – RFETS

identification, forming diverse teams, establishing a degree of rigor for planning, hazards controls, and identification of hazards specific job training requirements. The principle of graded approach is demonstrated throughout the procedure including screening the types of work; hazards identification; setting up diverse teams; and determining the level of planning, based on risk, complexity, etc., needed to plan the job. Job hazards are identified in both a pre-screen process and

when a job hazards analysis is done. The forming of diverse teams is driven (standards-based) by the analysis of job hazards, i.e., participation and review/approval phases is mandatory when identified in the hazards identification phase. The pre-screening process determines (numerical scale) the rigor of planning (requirements) for the job. The job hazards analysis process determines both the appropriate controls and the unique training required of the workers.

ATTACHMENT 9
SITE ANALYSIS – RFETS

SITE INFORMATION

Work Control Contact:	Address / Phone:
David Harrahy or Steven Little	P.O. Box 464, Golden, CO 80402-0464 (303) 966-3030 or (208) 529-5282

PROCEDURE REVIEWED

Procedure Number:	Revision:	Title:	Status:
MAN-071-IWCP	0 (CHG-4)	Integrated Work Control Program Manual	Approved

GENERAL NOTES & COMMENTS

The IWCP implements Integrated Safety Management (ISM) and provides detailed guidance on how the five steps of ISM are to be conducted at Rocky Flats. This manual:

- Identifies the specific regulatory requirements for work activities (other programs such as Safety & Industrial Hygiene and Nuclear Safety have requirements that must be integrated into the process controls of this manual, but these are not duplicated in this manual)
- Provides a chapter summary for selection of the proper tools depending on the work activity work scope
- Describes methods and controls to identify an activity
- Describes methods and controls to screen an activity or project for the purpose of identifying the proper level of planning
- Describes methods and the controls for the selected planning method to identify the hazards, develop the specific activity controls, and implement the specific activity controls
- Describes methods and the controls to select and use the appropriate vehicle for establishing the work implementing methodology
- Describes methods and the controls for developing operations and technical activity procedures
- Describes methods and controls to perform preventive maintenance operations, emergency work, and minor maintenance
- Provides a mechanism for feedback to ensure continuous improvement through the use of a Post Job Review (PJR)

The RFETS IWCP manual was the only procedure reviewed that covered all work on site. This IWCP manual is also the foundation by which RFETS implements ISMS across the entire plant site. Although the IWCP manual was long, it was easy to follow and laid out well. This IWCP manual provided many notable practices and many practices that were viewed as the DOE model.

**ATTACHMENT 9
SITE ANALYSIS – RFETS**

ANALYSIS DATA			
Lines of Inquiry	Score	Procedure Locator	Justification / Comments
1) How effective is this work control document in defining the work scope?	2.0		
a) How effective is the document in work identification?	1	Chapter 2	This manual provides a Work Control Form (WCF) which is used for identifying all types of work.
b) How effective is the document in initial work screening?	2	Chapter 2	This manual provides the use of an Activity Screening Form (ASF) which is completed by a Responsible Manager for screening an activity to determine the appropriate method of planning.
c) How effective is the document in requiring initial work authorization?	2	Chapter 2	The WCF is reviewed and receives approval from the Responsible Manager before any work may proceed for planning purposes. This also holds true for the ASF completed as well.
d) How well does this document involve the line management?	2	Chapter 1 & throughout	This manual is based on the reviews and determinations made by the Responsible Manager, which is the line manager for the applicable activity.
e) How effective is the document in applying the graded approach in distinguishing between the various types of work?	3	Entire Manual	This manual is used for ALL work at the Rocky Flats Site. It is the only one of its type across the DOE complex., and provides numerous methods for applying the graded approach.
2) How effective is this work control document in identifying the hazards?	2.7		
a) How comprehensive is this document in hazard identification?	3	Chapter 2 & 3	The ASF used for the initial screening provides the 1 st cut at identifying the hazards. The Job Hazard Analysis (JHA) provides an excellent tool in identifying the hazards, and providing the necessary controls. This is also a very user friendly checklist, in that it provides logic to prevent the user from having to answer all questions every time.
b) To what degree are tools (e.g., computerized, checklists, etc.) used for hazard identification?	2	Chapter 2 & 3	The ASF and JHA, along with the JHA guide provide the user with good tools for hazard identification.

Legend

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**ATTACHMENT 9
SITE ANALYSIS – RFETS**

Lines of Inquiry	Score	Procedure Locator	Justification / Comments
c) How well is the graded approach used in hazard identification?	3	Chapter 3	The JHA checklist provides excellent logic to assist the user to identifying the appropriate hazards.
d) How well is the graded approach used in forming diverse teams?	3	Chapter 2	The ASF is a standards-based screening tool completed by the Responsible Manager to determine the appropriate planning level along with the use of diverse teams. This ASF also provides the minimum team make-up when team planning is required.
e) How effective is this procedure for distinguishing between low, medium and high hazard tasks?	3	Chapter 2	The ASF is a standards-based screening tool to determine the proper planning method (i.e., Low, Medium or High).
f) To what level is the worker involved?	2	Chapter 3, 9	The JHA planning process requires the floor-level workers involvement in all planning methods used.
g) To what level are other organizations involved? (consider the following):	3	Chapter 2, 3	The ASF provides the necessary SME involvement for team planning. The JHA ensures that the SME's are involved based on the specific hazards identified.
• Environmental		Chapter 3, JHA	
• Industrial Hygiene		Chapter 3, JHA	
• Occupational Safety		Chapter 3, JHA	
• Radiological Control		Chapter 3, JHA	
• Engineering		Chapter 3, JHA	
• Quality Assurance/Control		Chapter 3, JHA	
• Facility/Operations/Departmental Personnel		Chapter 3, JHA	
• Fire Protection		Chapter 3, JHA	
• Criticality Safety		Chapter 3, JHA	
• Nuclear Safety		Chapter 3, JHA	

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ATTACHMENT 9
SITE ANALYSIS – RFETS

Lines of Inquiry	Score	Procedure Locator	Justification / Comments
<ul style="list-style-type: none"> Waste Management 		Chapter 3, JHA	Part of the Environmental Organization
3) How effective is this work control document in identifying and incorporating the hazard controls in the work instructions?	1.9		
a) How comprehensive is this document in identifying the appropriate hazard controls based on the hazards identified?	3	Chapter 3	The JHA Guide provides a detailed guide for determining the appropriate hazard controls for the hazards identified in the JHA. This includes the applicable training, permits, checklists, medical monitoring, and specific site information.
b) How effective (ease of use, probability of use) is this document in identifying the appropriate hazard controls based on the hazards identified?	2	Chapters 4-9	These chapters provide the necessary formatting instructions for developing the various document types described in this manual. They require the controls identified during the JHA be incorporated into the work documents.
c) How effective is this document in incorporating the hazard controls into the appropriate work document?	2	Chapter 4-9	This document provides the user with the appropriate level of detail to ensure the hazard controls are incorporated into the work execution steps.
d) How well does this document apply the graded approach concept in the planning and preparation of work documents (i.e., is this document flexible in format and content based on the application)?	2	Chapters 4-9	These chapters provide the various document types used for performing work at Rocky Flats. These types are tailored to the type of work being performed and provide an excellent graded approach methodology.
e) How well are lessons-learned and feedback incorporated into the planning process?	2	Chapter 3 & 10	Chapter 3 requires the review of the Lessons-Learned prior to performed the planning. Chapter 10 provides an excellent tool for conducting Post Job Reviews (PJR) which feed into the Lesson-Learned program.
f) How well does the document address “skill-of-craft” principles into the development of the work documents?	1	Chapter 11	This chapter provides a definition of skill-of-craft and is discussed throughout the manual for the development of the work documents.

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ATTACHMENT 9
SITE ANALYSIS – RFETS

Lines of Inquiry	Score	Procedure Locator	Justification / Comments
g) How well does this document implement engineering design changes?	1	Chapter 5 & 6	These chapters provide a method of ensuring that engineering is an integral part of the planning process to include the engineering design changes.
h) To what level is the worker involved?	2	Chapter 3	Requires mandatory involvement by the appropriate worker to help identify the hazards, hazard controls and work steps.
4) How effective is this work control document in the work performance?	1.5		
a) How effective is this document in material requisitioning and procurement?	1	Chapter 4	Appendix 4.5 provides the methodology for developing a detailed Bill of Materials (BOM) for all work documents, but does not provide the details for requisitioning materials.
b) How effective is this document in ensuring adequate work authorization (to include work document review, approval, and work release)?	2	Chapters 4-9	These chapters provide excellent details for the work document concurrence and approval, and ensure the graded approach is applied to these aspects. The Site Conduct of Operations (COOP) manual is referenced throughout this IWCP for work release instructions.
c) How effective is this document in work scheduling?	R		COOP Manual
d) How effective does this document address pre-job briefings?	1		COOP Manual provides specific instructions
e) How effective does this document address work execution instructions?	2		The document provides excellent guidance on the development and execution of work steps, and ensures the JHA controls are incorporated into the steps.
f) How effective and flexible is this document in addressing document revisions and field changes?	2	Chapters 4-9	This manual provides many ways to assist the user in easily obtaining field changes depending on the type of change associated with the work document type.
g) How effective is this document in addressing post-performance testing and acceptance?	1	Chapters 4-9	
5) How effective is this work control document in soliciting feedback?	1.3		

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**ATTACHMENT 9
SITE ANALYSIS – RFETS**

Lines of Inquiry	Score	Procedure Locator	Justification / Comments
a) How effective is this process in ensuring adequate close-out of the work documents?	1	Chapter 4-9	
b) How well does the document solicit/input feedback?	1	Chapter 10	This Chapter provides an excellent means of obtaining feedback via a PJR, and by using a Reference Library.
c) Does this document provide an avenue to obtaining feedback (e.g., does this process describe a post-job review approach)?	2	Chapter 10	This Chapter provides an excellent means of obtaining feedback via a PJR, and by using a Reference Library.
d) How flexible and user-friendly is this feedback system?	1	Chapter 10	This chapter provides the criteria as when a formal PJR is required, and allows for feedback at any time.
6) How effective is the work control document in addressing the training and qualification requirements?	2.0		
a) How effective is the work control document in identifying job unique training and qualification requirements?	3	Chapter 3	The JHA guide provides an excellent tool for determining the specific training requirements based on the hazards identified.
b) How effective is the work control document in verifying that training and qualification requirements are verified prior to the start of work?	1	Chapter 4-9	Require the controls of the JHA be incorporated into the work documents (i.e., training is an administrative control). COOP manual also addresses this in the Pre-Ev Briefings.
7) How adequately does the work control document address the roles and responsibilities for those personnel involved?	1.0	Chapter 1	Chapter 1 provides a list of the roles and responsibilities for all personnel involved. This is also addressed throughout the manual by the use of SHALL and Should statements
8) How well does the work control document address the balance of priorities with respect to safety implications and time?	2.0	Chapter 2	WCF, priority and job classifications.

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ATTACHMENT 9
SITE ANALYSIS – RFETS

GENERAL SITE QUESTIONS	
Question	Response
1) How adaptable is this document to other DOE Sites?	This manual is comprehensive, and parts of this document can be easily extracted and adapted for other sites. It may be difficult, however, to adapt the entire process, but INEEL has incorporated approximately 90% of this manual into their process.
2) How broad of a spectrum does this document cover?	ALL Work on Site
a) Can this document be used for the following activities?	
• Corrective Maintenance	Yes
• Preventive Maintenance	Yes
• D&D	Yes
• Operations	Yes
• Construction	Yes
• R&D	Yes
• Environmental Restoration/Remediation	Yes
• Other (i.e., Services, Surveillances, utilities, Service technicians, etc.) – Specify	Yes
• Services/Warranty Type Work	Yes
3) Does this work control document require the support of a CMMS? – Specify Software Used.	No (Site uses Oracle '98 for Work Identification Only)

ATTACHMENT 10
SITE ANALYSIS – SRS

WORK CONTROL SUMMARY

Savannah River Site consists of 9 Operational Divisions, all of which have maintenance departments. Each maintenance department within a division owns from 1 to 4 separate maintenance facilities, depending on mission, facility layout, etc., for a total of ~29 maintenance facilities on site.

The Senior Maintenance Management Council (SMMC) is the sitewide policy-setting authority for maintenance that creates and maintains company-level policies and procedures affecting the Conduct of Maintenance. The council serves as the site focal point for internal communications as well as external communications with DOE-SR and other regulating authorities concerning sitewide maintenance issues.

In detail, the SMMC:

- establishes and promulgates a WSRC maintenance policy
- develops and communicates WSRC maintenance principles
- identifies, defines and sets policy for maintenance issues that
- require common strategies

- establishes the implementation strategies for maintenance
- initiatives necessary to ensure WSRC is in compliance with DOE Orders
- and expectations
- standardizes WSRC Maintenance Administrative policies, where
- practical, to eliminate duplications
- ensures cost effective application of sitewide maintenance resources including manpower, equipment, facilities, and training.

The SMMC consists of one representative appointed by the division level 1 managers of those divisions with maintenance personnel. Procedure Manual 1Y is the single site document which establishes the conduct of maintenance requirements for each division and facility. Section 1 of the manual sets maintenance standards and requirements for work in nuclear facilities and on nuclear equipment. Section 2 of the manual sets maintenance standards and requirements for work in non-nuclear facilities and on non-nuclear equipment outside of these facilities. All divisions and facilities are responsible and accountable for the implementation of this manual. During the past few years through re-engineering efforts, a complete

ATTACHMENT 10
SITE ANALYSIS – SRS

change has taken place in the way maintenance activities are planned, scheduled, performed, closed out and interfaced with other organizations. Procedure 1Y, 8.20 Work Control Procedure is presently being rolled out across the site. This new process establishes a Work Management Center as the entry point for all maintenance activities within a facility with Work Window Managers, and Work Window Coordinators being the single point of contact for maintenance work initiation.

Fix-It-Now (FIN) teams are also established to perform maintenance activities within a particular scope with limited paperwork. If a particular job is outside of FIN scope as described in Procedure 8.20, the FIN team performs an initial walkdown of the job to begin identifying hazards and aid the planner in work package preparation. Another concept of the Work Management Center is to house contacts from Operations, RadCon, IH, and other organizations necessary to complete work preparation and reviews in “real time”. Work activities are scheduled during an Optimum Performance Window. The Work Window Manager is responsible for ensuring availability of parts, tools,

materials, equipment, personnel, permits, managing schedule performance, expediting work, and resolving obstacles to schedule execution. The Work Window Managers conduct Work Week reviews to ensure schedule validity, logic, and accuracy.

INDUS PassPort is the Computerized Maintenance Management System necessary to fully implement SRS’ new Work Control Process. During 1999 PassPort is being installed and rolled out across the site along with the new work control process with an expected completion date of late 1999 for both processes.

NOTABLE PRACTICES

The Savannah River Site (SRS) architecture for procedures consists of multiple manuals (broad subject areas like maintenance, safety, engineering, etc.) and multiple procedures within each manual. Procedures reviewed included the site-wide maintenance work control procedure, and two safety procedures: the Job Hazards Analysis program and the Work Clearance and Authorization program. SRS has validated that the Integrated Safety Management functions and principles are

ATTACHMENT 10
SITE ANALYSIS – SRS

included in their procedures; however, upon a reading of the work control procedures reviewed, the terminology of Integrated Safety Management functions and principles is not used. All supporting technical disciplines (Industrial Health, Rad., environmental) participate in the work control process through the Work Management Center. The SRS procedures tend towards being expert-based. The SRS work control procedure covers all work performed onsite by maintenance and construction organizations, including corrective maintenance, services, modifications, preventive maintenance, etc. Excluded from the requirements of the work control procedure is project work. The work

control process is heavily dependent upon the PassPort computerized maintenance management system as many procedure instructions related to using the PassPort system.

The formulation and performance of diverse teams was a notable practice. The SRS practice of screening work through the Fix It Now (FIN) teams, and, if the work needs more hazards identification and job planning, it is passed on to the Work Management Centers (WMC's) where resident technical support discipline personnel join in the process. The WMC's function as a fully integrated team at the SRS.

ATTACHMENT 10
SITE ANALYSIS – SRS

CONTACT INFORMATION

Work Control Contact:	Address / Phone:
Jackie Wilkinson	P.O. Box 6809, Aiken, SC 29804,-6809 (803) 725-7478

PROCEDURE REVIEWED

Procedure Number:	Revision:	Title:	Status:
Manual 1Y, Procedure 8.20	Rev. 0	Work Control Pilot Procedure	Approved
Manual 8Q, Procedures 35	Rev. 4	Work Clearance and Authorization	Approved
and 38	Rev. 1	Job Hazardous Analysis Program	Approved

GENERAL NOTES & COMMENTS

- 1) The Savannah River Site (SRS) procedures architecture consists of multiple manuals (1Y-Maintenance, 8Q-Safety, EY-Engineering), and multiple procedures within each manual. The 1Y Maintenance Manual has about 20 procedures for nuclear facilities. Work Control at SRS is defined by many procedures, however, only 3 were looked at in this work control evaluation. They are 1Y, 8.20; 8Q 35; and 8Q 38.
- 2) The SRS procedures evaluated covered only the following types of work: corrective maintenance and services work.
- 3) The procedures were written, not with an ISM orientation, but in a traditional (maintenance management) format. ISM core functions and principles were not obvious. These procedures were not used as a tools to implement ISM.
- 4) All SRS procedures were **not exportable** to other sites because they are written to the unique computer application at SRS. The procedures, particularly 1Y 8.20 was partly work control instructions and partly computer user (keyboard operator) instructions, as the entire procedure was written around the integration of work control into the PassPort Computer Maintenance Management System (CMMS).
- 5) The procedures, written in a narrative format, were not user-friendly to an external reviewer. The procedures:
 - a. Gave a list of other procedures (example 1Y, B.3.c.(1), page 17), but there were few directions given in the narrative instructions when one would expect to be referenced to another procedure.
 - b. Were very confusing and difficult to follow (locate things) in the narrative format.
 - c. All attachments were not referenced in the procedure. The work control flow diagram was not mentioned and was found on page 61 of 62.
 - d. Some attachments appeared to be stand-alone with no integration into the procedure.
 - e. Important work control instructions were “buried” in the narrative and difficult to identify.
 - f. Information was hard to find because there was no table of contents for this procedure.
 - g. The narrative and attachments were not well integrated.
 - h. Was comprehensive in discussing actions peripheral to the core work control process. Examples are computer instructions to check for duplicate work requests, combining similar work requests into one, etc. Generally, it was difficult to identify meaningful content in the narrative.
 - i. Check lists were comprehensive (1Y, pages 16-18), but would they be used in the work control process?
- 6) Procedure 8Q, 38 was the JHA Program. It was a stand alone program and was not integral to the work control procedures.

**ATTACHMENT 10
SITE ANALYSIS – SRS**

ANALYSIS DATA			
Lines of Inquiry	Score	Procedure Locator	Justification / Comments
1) How effective is this work control document in defining the work scope?	1.0		All work control processing is electronic dependent.
a) How effective is the document in work identification?	1	1Y, 1.A.1, p. 5 1Y, b.1, p. 13	Condition Tag required to be attached. Work requests called in to the Work Management Center (WMC). Work Request form in Pass Port
b) How effective is the document in initial work screening?	1	1Y, A.2, p. 8, 1Y, A.3	Walk down by FIN (Fix It Now) team by supervisor/craft.
c) How effective is the document in requiring initial work authorization?	1	8Q-35, A.3	Validity screen.
d) How well does this document involve the line management?	1	8Q-35, A.3	WMC includes Building Custodian. WCF (Work Clearance Permit) Section 5.
e) How effective is the document in applying the graded approach in distinguishing between the various types of work?	1	1Y8.20, B.1, B.2	Only between FIN and planned job. Limited to maintenance, not other types of work.
2) How effective is this work control document in identifying the hazards?	1.2		
a) How comprehensive is this document in hazard identification?	1	8Q-35 8Q-38, Attach. B 1Y-8.20, pg 9, 16,17	WCP, Section 2 for each job. JHA separate. Done by WMC staff.
b) To what degree are tools (e.g., computerized, checklists, etc.) used for hazard identification?	1	1Y8.20, Attach. O, 8Q-35, 8Q-38	JHA determination by 8Q Procedure 38 (pg. 9) 8Q-35 WCP Attachment B checklist.
c) How well is the graded approach used in hazard identification?	R	8Q-35	
d) How well is the graded approach used in forming diverse teams?	2	1Y 8.20 8Q, #38	Procedure is silent, or random references to other SME's. Procedure does not discuss forming teams.

Legend

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ATTACHMENT 10
SITE ANALYSIS – SRS

Lines of Inquiry	Score	Procedure Locator	Justification / Comments
e) How effective is this procedure for distinguishing between low, medium and high hazard tasks?	R	8Q-35, SEC. 2 1Y8.20	All non-FIN walkdowns and WMC Teams assign to WMC as primary responsibility. There is no discussion in any procedure. No difference to low medium or high levels.
f) To what level is the worker involved?	1		Only planner <u>may</u> walk job down.
g) To what level are other organizations involved? (consider the following):	1	1Y, 8.20, Attach. B 8Q #35 and 38	WMC team is a notable practice. Organizations randomly listed in procedure. For approvals, Attach. B provides a list. Most organizations are listed in responsibility section. Check lists to not drive participation.
• Environmental			
• Industrial Hygiene			
• Occupational Safety			
• Radiological Control			
• Engineering			
• Quality Assurance/Control			
• Facility/Operations/Departmental Personnel			
• Fire Protection			
• Criticality Safety			May be in Rad Con
• Nuclear Safety			May be in Rad Con
• Waste Management			May be in Envir.
3) How effective is this work control document in identifying and incorporating the hazard controls in the work instructions?	0.6		

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ATTACHMENT 10
SITE ANALYSIS – SRS

Lines of Inquiry	Score	Procedure Locator	Justification / Comments
a) How comprehensive is this document in identifying the appropriate hazard controls based on the hazards identified?	1	8Y-38 WCP Section 3	Only general guidance and examples are given in parts of the procedure.
b) How effective (ease of use, probability of use) is this document in identifying the appropriate hazard controls based on the hazards identified?	1	1Y8.20, B.3.b WCP Section 3	
c) How effective is this document in incorporating the hazard controls into the appropriate work document?	1	1Y8.20, B.3.b 8Q-35 WCP	Gives planner guidelines for WCP.
d) How well does this document apply the graded approach concept in the planning and preparation of work documents (i.e., is this document flexible in format and content based on the application)?	1	1Y8.20, B.2 8Q-35	Only general implications.
e) How well are lessons-learned and feedback incorporated into the planning process?	0	1Y8.20, B.3	Requires use of equipment history screen in PassPort.
f) How well does the document address “skill-of-craft” principles into the development of the work documents?	0	1Y8.20, B.3	
g) How well does this document implement engineering design changes?	1	1Y8.20, B.2.b 8Q-35	Attach G. Under Work Authorization.
h) To what level is the worker involved?	0		
4) How effective is this work control document in the work performance?	1.0		
a) How effective is this document in material requisitioning and procurement?	1	1Y, B.2, B.4, pg. 24	Materials listed on Attach. O, Walkdown 1Y, C.2 talks about scheduling materials
b) How effective is this document in ensuring adequate work authorization (to include work document review, approval, and work release)?	1	1Y, B.6, p. 19 1Y, C.4, p. 22	WCP Sections 4, 5, and 6 B.6 never says who approves, serial process C.4 is “schedule” approval only
c) How effective is this document in work scheduling?	1	1Y8.20, C., p. 20-21 1Y8.20, D.1, p. 23	Process is unique to SRS. Complete description of traditional process. Lot of computer steps.

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ATTACHMENT 10
SITE ANALYSIS – SRS

Lines of Inquiry	Score	Procedure Locator	Justification / Comments
d) How effective does this document address pre-job briefings?	1	1Y, D.2.d, p. 23 8Q-35	No description of scope of pre-job brief. Somewhere in narrative and Attachment A.
e) How effective does this document address work execution instructions?	1	1Y, D.3.a and b., p. 24, 25, Attach. D 8Q-35	Long list of required practices. Is a procedure writers guide.
f) How effective and flexible is this document in addressing document revisions and field changes?	1	1Y, A.1.e, p. 6 Attach E, 8Q-35	Reference to engineering EY manual. Paragraph 5
g) How effective is this document in addressing post-performance testing and acceptance?	1	1Y8.20, D.3.c, E.1.b 8Q-35	Reference Manual 1Y, Procedure 9.01.
5) How effective is this work control document in soliciting feedback?	0.5		
a) How effective is this process in ensuring adequate close-out of the work documents?	1	1Y8.20, D.4, E. 8Q-35	Paragraph 6
b) How well does the document solicit/input feedback?	0		
c) Does this document provide an avenue to obtaining feedback (e.g., does this process describe a post-job review approach)?	1	1Y8.20, E.2	
d) How flexible and user-friendly is this feedback system?	0		
6) How effective is the work control document in addressing the training and qualification requirements?	R	4B Manual	All training requirements found in 4B manual
a) How effective is the work control document in identifying job unique training and qualification requirements?	0		
b) How effective is the work control document in verifying that training and qualification requirements are verified prior to the start of work?	1	1Y8.20, D.3.a.(1), Bullet#1, p. 24	

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ATTACHMENT 10
SITE ANALYSIS – SRS

Lines of Inquiry	Score	Procedure Locator	Justification / Comments
7) How adequately does the work control document address the roles and responsibilities for those personnel involved?	1.0	Responsibilities p. 2 to 5	Simple and straight forward. Responsibilities are stated throughout the procedure, but difficult to identify.
8) How well does the work control document address the balance of priorities with respect to safety implications and time?	1.0	1Y8.20, Attach. A	One reference only in procedure to Attachment A. Good breakout of priorities.

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ATTACHMENT 10
SITE ANALYSIS – SRS

GENERAL SITE QUESTIONS	
Question	Response
1) How adaptable is this document to other DOE Sites?	No. Heavily dependent on use of PassPort and procedures are written to this end.
2) How broad of a spectrum does this document cover?	
a) Can this document be used for the following activities?	
• Corrective Maintenance	Yes. Purpose on p. 1.
• Preventive Maintenance	Yes
• D&D	No
• Operations	No
• Construction	Yes
• R&D	No
• Environmental Restoration/Remediation	No
• Other (i.e., Services, Surveillances, utilities, Service technicians, etc.) – Specify	Yes
• Services/Warranty Type Work	Yes
3) Does this work control document require the support of a CMMS? – Specify Software Used.	Yes, PassPort is used.

ATTACHMENT 11
SITE ANALYSIS – COMMERCIAL PLANT #1

WORK CONTROL SUMMARY

The following is a summary of a Commercial Nuclear Utility work control program and how that program compares to the core functions and guiding principles of the Integrated Safety Management System (ISMS) that forms the basis for work control at DOE sites.

GENERAL OVERVIEW

The Commercial Nuclear Power Plant (CNPP) work control program consists of two basic elements, planning and scheduling. The planning activities are conducted by trained and qualified planners using an automated planning system which generates all work packages. Work packages include precautions, prerequisites, job steps, references, cautions, notes, and warnings, sign-off blocks, hazard controls, and post job testing/return to service requirements. The work control program is described and implemented through the use of multiple controlled documents.

The second element of the work control program is scheduling, which is conducted by work scheduling staff, with routine input

and coordination from the various division managers, including operations. Scheduling is accomplished using Primavera software, linked to the planning system. Work schedules are generated daily for use by plant operators and maintenance personnel.

SCOPE

The scope of the CNPP work control program covers primarily preventive, corrective and minor maintenance activities. These activities also utilize engineering support as needed for the specific job. Larger engineering jobs (modifications) are also included in the work control program. The engineering group develops the necessary engineering specifications/designs and then the planners develop the actual work package to be executed.

Operations and non-maintenance activities are not included in the work planning portion of the program but are manually input into the scheduling portion of the system. In general, most activities at the plant are included on the master schedule. The plant is in the process of identifying and including routine, non-maintenance

ATTACHMENT 11
SITE ANALYSIS – COMMERCIAL PLANT #1

activities into the automated planning system.

When work packages require engineering drawings, the specific drawings are printed from the master drawing file, which contains the most up-to-date drawings and included in the work package. Drawings are updated upon closeout of a work package, as needed, thereby maintaining the most up-to-date drawings in the system. All drawings have been scanned for computer use and printing for work package support.

Work related hazard analysis and control is primarily concerned with nuclear safety due to the operational nature of the power plant and the safety implications associated with nuclear power operations. When work is planned, the impacts to nuclear safety are evaluated assessing the impact that the work has to the risk of a core melt and also the risk of a automatic plant trip (shutdown). These analyses are conducted using an automated system that evaluates the impact that a specific job, as well as all jobs being conducted at given time, will have to the Probabilistic Risk Assessment assumptions and bases. This analysis results in a High, Medium, and Low risk situation. High risks are not allowed, Medium risks are to be

avoided, with Low risk being the preferred condition. Checklists are used to facilitate initial risk screening and hazard identification, particularly for radiation risk related work activities.

Industrial and other OSHA related hazards and controls are primarily identified by the planner in the development of the work document. Skill-of-the-craft is relied upon heavily for the safe conduct of work. A team based approach to planning and worker involvement in hazard identification is only used when a job has been identified as having a high radiation risk.

The current work control program is viewed as critical to the plant mission, as evidenced by the fact that the director of plant work control is a senior manager position at the plant. The plant does not track work control performance measures as part of the program.

NOTABLE PRACTICES

Note: Work control procedures from two commercial nuclear power plants were evaluated using the same ISM lines of inquiry as used for the DOE sites. The purpose of evaluating the commercial plants

ATTACHMENT 11
SITE ANALYSIS – COMMERCIAL PLANT #1

was to provide some external reference for DOE site work control procedures. Caution should be exercised in drawing conclusions or comparing this analysis information, as there are substantial differences in mission, organization and management direction.

A set of seven work control-related procedures/documents were evaluated from Commercial Nuclear Plant #1. Since no dedicated program such as Integrated Safety Management was in effect at this plant, the work control procedures presented a traditional approach to work control of maintenance and related activities. These procedures covered primarily maintenance, engineering support, and modification activities, but also included an additional procedure to address the hazards and necessary controls for high radiation risk work. There was no direct counterpart to comprehensive hazards identification and controls in the commercial work control practices. There is however a formalized, computer-based process for identifying key nuclear safety risk issues (core melt and plant trip risks) resulting from the risks posed to the plant of all maintenance and work activities being done at the plant at any

given time. Additionally, there is strong reliance on worker “skill-of-the-craft” and planner expertise for the safe conduct of work activities.

Notable and outstanding notable practices were present in the areas of work scheduling, risk/hazard identification (in the context of nuclear plant operations), document configuration control, and work process integration (engineers/planners). The plant uses a scheduling/project management system that is directly linked to the planning system. Additionally, all work activities done at the plant (including operations) is included on the integrated plant schedule. Similarly, a formalized process is used for identifying, screening, and scheduling work activities that includes line management, SMEs, planners, engineers, and work control personnel. Plant risk assessment process identifies impact to nuclear safety from individual work activities, as well as collective impact of all work activities, and is updated on a daily basis. Roles and responsibilities are clearly understood and work authorization requirements are clearly defined and are part of work and supervisor training. Changes to plant systems resulting from maintenance or

ATTACHMENT 11
SITE ANALYSIS – COMMERCIAL PLANT #1

work activities are updated in master drawings immediately upon completion of the work. Drawings are maintained on a computer system for ease of use in work

package preparation and engineering design an support. Engineering support and design is well integrated into work control and planning.

ATTACHMENT 11
SITE ANALYSIS – COMMERCIAL PLANT #1

PROCEDURE REVIEWED

Procedure Number: Various (see below)	Revision:	Title: Conduct of Plant Work Control	Status: Approved
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GENERAL NOTES & COMMENTS

The commercial nuclear utility work control program is contained in multiple documents that comprise the core program. The documents reviewed include:

- Conduct of Plant Work Control (MN-1-120 Rev 1)
- Conduct of Maintenance (MN-1-100 Rev 16)
- Control of Radiation Protection Risk Significant Work (RP-1-102 Rev 5)
- Maintenance Order Planning (MN-1-200 Rev 18)
- Control of Maintenance Activities (MN-1-101 Rev 19)
- Operations Maintenance Coordination (N-1-115 Rev 1)
- Maintenance Order Processing (MN-1-205 Rev 9)

The scope of the commercial work control program is two-fold: work planning that covers primarily preventive, corrective, and minor maintenance, with engineering support provided as needed, and secondly work scheduling.

This analysis is based on a comparison of the work control practices of the commercial nuclear utility to the core functions and guiding principles of the DOE ISMS concepts, from which the performance elements of the lines of inquiry are based.

Work control hazard analysis is primarily based on evaluating the impact to nuclear safety of the plant. The emphasis is on the impact and individual job and the aggregate impact that all jobs may have on the risk of causing a core melt and also a plant trip (automatic shutdown). This analysis is accomplished using an automated tools that identifies the relative risks based on the impact to the Probabilistic Risk Assessment assumptions.

Worker safety, fire protection, etc. are addressed through work package development, accomplished by the planner. Skill-of-the-craft knowledge is relied upon heavily for the safe conduct of work.

ATTACHMENT 11
SITE ANALYSIS – COMMERCIAL PLANT #1

ANALYSIS DATA			
Lines of Inquiry	Score	Procedure Locator	Justification / Comments
1) How effective is this work control document in defining the work scope?	1		
a) How effective is the document in work identification?	1	MN-1-120; MN-1-101; RP-1-102; MN-1-205	Work can be identified by any worker. Planned items are identified by respective managers
b) How effective is the document in initial work screening?	1	MN-1-120 MN-1-101; RP-1-102; NO-1-115	Work screening is done by respective maintenance work group supervisor
c) How effective is the document in requiring initial work authorization?	1	MN-1-120	Work authorization is needed by respective work supervisor, operations, and QSS team (scheduling)
d) How well does this document involve the line management?	1	MN-1-120	Line managers involved in planning approval and scheduling
e) How effective is the document in applying the graded approach in distinguishing between the various types of work?	1	MN-1-120	Graded approach applied to risk associated with the work, not with the planning required for the job.
2) How effective is this work control document in identifying the hazards?	1.4		
a) How comprehensive is this document in hazard identification?	1	MN-1-120; RP-1-102	Primary focus of hazard identification is nuclear safety risk associated with conducting the work (impact to the plant)
b) To what degree are tools (e.g., computerized, checklists, etc.) used for hazard identification?	2	MN-1-120; RP-1-102	PRA computerized analysis tool used to evaluate core melt risk and plant trip risk: basis for nuclear safety analysis; risk assessment checklists used for general evaluation
c) How well is the graded approach used in hazard identification?	2	MN-1-120; RP-1-102	PRA tool identifies individual job risk to plant and aggregate risk based on all jobs being conducted
d) How well is the graded approach used in forming diverse teams?	1	MN-1-120; RP-1-102	Team based planning only required/used for high radiation risk work; Formal standing planning team used to validate, schedule and coordinate work activities

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ATTACHMENT 11
SITE ANALYSIS – COMMERCIAL PLANT #1

Lines of Inquiry	Score	Procedure Locator	Justification / Comments
e) How effective is this procedure for distinguishing between low, medium and high hazard tasks?	2	MN-1-120; RP-1-102	Addresses nuclear safety risk in an extremely effective manner; does not address worker safety issues
f) To what level is the worker involved?	1	RP-1-102	Worker only involved in high radiation risk work activities
g) To what level are other organizations involved? (consider the following):	1	MN-1-120; MN-1-100	Commercial utility involve different set of organizations based on nature plant operations
• Environmental			
• Industrial Hygiene			
• Occupational Safety			
• Radiological Control			
• Engineering			
• Quality Assurance/Control			
• Facility/Operations/Departmental Personnel			
• Fire Protection			
• Criticality Safety			
• Nuclear Safety			
• Waste Management			
3) How effective is this work control document in identifying and incorporating the hazard controls in the work instructions?	1.4		
a) How comprehensive is this document in identifying the appropriate hazard controls based on the hazards identified?	2	MN-1-120; RP-1-102	Hazard controls, based on PRA nuclear safety analysis can be modified based on changes to work steps/requirements or other jobs that may have an impact. Checklists used to assist in identifying hazards and controls.

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ATTACHMENT 11
SITE ANALYSIS – COMMERCIAL PLANT #1

Lines of Inquiry	Score	Procedure Locator	Justification / Comments
b) How effective (ease of use, probability of use) is this document in identifying the appropriate hazard controls based on the hazards identified?	1	MN-1-120; RP-1-102; MN-1-200	Compensatory measures, used to control the impacts of performing the work are identified and listed as a separate sheet in the work package.
c) How effective is this document in incorporating the hazard controls into the appropriate work document?	1	MN-1-200	Compensatory measures are identified and listed as a separate sheet in the work package. Additional work step specific controls are also identified in the work document.
d) How well does this document apply the graded approach concept in the planning and preparation of work documents (i.e., is this document flexible in format and content based on the application)?	1	MN-1-200	Graded approach is applied to impact level of plant risk, not to level of planning required
e) How well are lessons-learned and feedback incorporated into the planning process?	1	MN-1-120	Automated planning system allows planners to incorporate lessons-learned from similar previous work packages
f) How well does the document address “skill-of-craft” principles into the development of the work documents?	2	MN-1-100 MN-1-200	Skill-of-the-craft is relied upon heavily for the safe conduct of most work. Specific work list identifies typical skill-of-the-craft work.
g) How well does this document implement engineering design changes?	2	MN-1-200	Engineering support is an integral part of work control. Engineers provide design support, then planners develop the overall work document. Engineering document configuration control is very effective. Drawings are updated immediately upon completion of work
h) To what level is the worker involved?	1	RP-1-102	Worker is usually not involved in hazard identification, except for high radiation risk work.
4) How effective is this work control document in the work performance?	1.4		
a) How effective is this document in material requisitioning and procurement?	1	MN-1-200	Planners coordinate with procurement to obtain necessary parts and supplies to conduct the work
b) How effective is this document in ensuring adequate work authorization (to include work document review, approval, and work release)?	2	MN-1-101; MN-1-200; MN-1-205	Includes work document review and approval as well as approval to begin work.
c) How effective is this document in work scheduling?	3	MN-1-120	Integrated scheduling tool linked to planning system. All work conducted at the plant is identified on the overall plant schedule, including operations, procedures, etc.

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ATTACHMENT 11
SITE ANALYSIS – COMMERCIAL PLANT #1

Lines of Inquiry	Score	Procedure Locator	Justification / Comments
d) How effective does this document address pre-job briefings?	1	MN-1-100 MN-1-101; RP-1-102	Pre-job briefings conducted by work supervisor for most jobs
e) How effective does this document address work execution instructions?	1	MN-1-101; MN-1-100	Completion and sign-off steps included in work documents
f) How effective and flexible is this document in addressing document revisions and field changes?	1	MN-1-205	Field changes allowed, specific requirements are included for document revision
g) How effective is this document in addressing post-performance testing and acceptance?	1	MN-1-101	Post maintenance testing clearly identified in work document and also included as separate line item on schedule
5) How effective is this work control document in soliciting feedback?	1		
a) How effective is this process in ensuring adequate close-out of the work documents?	1	MN-1-101	Work document closeout steps clearly identified
b) How well does the document solicit/input feedback?	1	RP-1-102	Feedback is primarily done on informal basis
c) Does this document provide an avenue to obtaining feedback (e.g., does this process describe a post-job review approach)?	1	RP-1-102; MN-1-101	Post Job Reviews only required for high radiation risk work. Repeat maintenance items are reviewed for cause and trends
f) How flexible and user-friendly is this feedback system?	1	RP-1-102; MN-1-101	Suggestion box system in use at the plant, but input is not formally tracked or controlled
6) How effective is the work control document in addressing the training and qualification requirements?	1.0		
a) How effective is the work control document in identifying job unique training and qualification requirements?	1	MN-1-100	Need for specific training is identified
b) How effective is the work control document in verifying that training and qualification requirements are verified prior to the start of work?	1	MN-1-100	Due to regulated nature of work, all workers have qualifications which are maintained and tracked by training department.
7) How adequately does the work control document address the roles and responsibilities for those personnel involved?	1	All; MN-1-100 (worker)	Roles and responsibilities clearly identified in each document

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ATTACHMENT 11
SITE ANALYSIS – COMMERCIAL PLANT #1

Lines of Inquiry	Score	Procedure Locator	Justification / Comments
8) How well does the work control document address the balance of priorities with respect to safety implications and time?	1	NO-1-115	Integrated planning and scheduling approach ensure appropriate balance. Specific document addresses operations vs. maintenance/safety priorities

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**ATTACHMENT 11
SITE ANALYSIS – COMMERCIAL PLANT #1**

GENERAL SITE QUESTIONS	
Question	Response
1) How adaptable is this document to other DOE Sites?	Not applicable. Commercial utility application with emphasis based on operating nuclear power plant
2) How broad of a spectrum does this document cover?	Covers all types of maintenance
a) Can this document be used for the following activities?	
• Corrective Maintenance	Yes
• Preventive Maintenance	Yes
• D&D	No
• Operations	Yes (Scheduling Only)
• Construction	Yes (supports some “modification” work)
• R&D	No
• Environmental Restoration/Remediation	No
• Other (i.e., Services, Surveillances, utilities, Service technicians, etc.) – Specify	Some surveillances, minor maintenance
• Services/Warranty Type Work	No
3) Does this work control document require the support of a CMMS? – Specify Software Used.	Yes (Planning and Scheduling)

ATTACHMENT 11
SITE ANALYSIS – COMMERCIAL PLANT #1

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ATTACHMENT 12
SITE ANALYSIS – COMMERCIAL PLANT #2

WORK CONTROL SUMMARY

A set of five work control-related procedures were evaluated from Commercial Nuclear Plant #2. Since no dedicated program such as Integrated Safety Management was in effect at this plant, the work control procedures presented a traditional approach to work control of maintenance activities. These procedures covered only maintenance and modifications performed through the maintenance activity. There was no programmatic counterpart to the hazards identification and hazards control functions in the commercial Nuclear Plant #2 procedures, although safety areas and safety controls were included. The procedures reflected a formalized process (heavy use of flow diagrams) and a strong culture of Conduct of Maintenance.

NOTABLE PRACTICES

Note: Work control procedures from two commercial nuclear power plants were evaluated using the same ISM lines of

inquiry as used for the DOE sites. The purpose of evaluating the commercial plants was to provide some external reference for DOE site work control procedures. Caution should be exercised in drawing conclusions or comparing this analysis information, as there are substantial differences in mission, organization and management direction.

Notable and outstanding notable practices were found in those phases of work control that would be expected. Namely, the areas were initial screening, work coordination, material logistics, scheduling, control of the work execution, and post-job evaluation. Work requirements were thoroughly screened to validate the need of the work and to determine how best to accomplish the work, whether it be Tool Pouch, minor maintenance, on-line or work request. Comprehensive material planning and scheduling requirements were driven by the need to do maximum maintenance during an outage period. Extensive post-performance reviews, lessons learned and analyses were done as part of their continuous improvement program.

ATTACHMENT 12
SITE ANALYSIS – COMMERCIAL PLANT #2

PROCEDURE REVIEWED

Procedure Number: See Below	Revision: See Below	Title: See Below	Status:
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GENERAL NOTES & COMMENTS

Procedures reviewed as part on this evaluation include:

- WC-3001, Rev. 1-Work Screening and Classification. Appendix A is a Conditioned Based Monitoring program (predictive maintenance).
- WC-3005, Rev. 2-Maintenance Planning. Maintain design basis of plant. Very comprehensive in defining coordination, material, scheduling and engineering requirements.
- WC-3006, Rev. 1-On Line Maintenance
- WC-3009, Rev. 0-Conduct of Maintenance
- WP-WM-10. Rev. 2-Preparation of Maintenance Work Packages. Extensive instructions on using the EWMS computer system, and Planner's Guide.

Procedures are fully integrated with the Electronic Work Management System (EWMS) computer system for data entry, getting forms, etc. There are separate procedures for each work control phase. Provides detailed planning guidance on how to write a work package.

Procedures are succinct, use flow diagrams extensively and describe the procedure by following the flow diagrams closely. Process is driven by the flow diagram and the direct ties to EWMS computer system. Standard format is used throughout. Flow diagrams are shown at an overview level, intermediate and detailed step-by-step levels in each procedure. The philosophies of configuration management and conduct of operations are prevalent.

ATTACHMENT 12
SITE ANALYSIS – COMMERCIAL PLANT #2

ANALYSIS DATA			
Lines of Inquiry	Score	Procedure Locator	Justification / Comments
1) How effective is this work control document in defining the work scope?	1.6		
a) How effective is the document in work identification?	1	3001	
b) How effective is the document in initial work screening?	2	3001-E.1.0, 2.0	Several pages of flow diagrams. Screens out minor and invalid work.
c) How effective is the document in requiring initial work authorization?	2	3001-E.1.0, 2.0, 3.2, 4.0	Screening by SME's (pg. 24 definition)
d) How well does this document involve the line management?	1	3001 3005	Ex: Step 2.5, System Manager approval.
e) How effective is the document in applying the graded approach in distinguishing between the various types of work?	2	3001-E.1.0, 2.0	Distinguishes between minor maintenance, facility maintenance, Work Request maintenance.
2) How effective is this work control document in identifying the hazards?	0.6		
a) How comprehensive is this document in hazard identification?	1	3001-E.4.0, Attach. B, WM-10-6.3.4	Step 1.9 and 1.10 is pre-job walkdown Pre-Analysis checklist. Check lists.
b) To what degree are tools (e.g., computerized, checklists, etc.) used for hazard identification?	1	3001-Attach. B	Basic list of planning, safety, pre-work and work issues
c) How well is the graded approach used in hazard identification?	0		
d) How well is the graded approach used in forming diverse teams?	1	3001-E.4.0, 3005-E.2.0	Step 1.12, Screening Committee Most technical disciplines are identified in flow diagram, but little safety and environmental.
e) How effective is this procedure for distinguishing between low, medium and high hazard tasks?	1	3001- 3005-E 3004-B.1.6, D.1.0	
f) To what level is the worker involved?	0		

Legend

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ATTACHMENT 12
SITE ANALYSIS – COMMERCIAL PLANT #2

Lines of Inquiry	Score	Procedure Locator	Justification / Comments
g) To what level are other organizations involved? (consider the following):	1		
• Environmental			No
• Industrial Hygiene		3005-Step 4.8	Yes
• Occupational Safety		3005-Step 4.8	Yes
• Radiological Control		3004-2.7	Yes
• Engineering		3005-Many steps	Yes
• Quality Assurance/Control		3004-Attach G WM-10	Closure report only For QC steps
• Facility/Operations/Departmental Personnel			Yes
• Fire Protection		3005-3.12	Yes
• Criticality Safety			?
• Nuclear Safety			?
• Waste Management			No
3) How effective is this work control document in identifying and incorporating the hazard controls in the work instructions?	0.8		
a) How comprehensive is this document in identifying the appropriate hazard controls based on the hazards identified?	1	3009-3.0, Step 1.3	
b) How effective (ease of use, probability of use) is this document in identifying the appropriate hazard controls based on the hazards identified?	1	3009-3.0, Step 1.4	

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Lines of Inquiry	Score	Procedure Locator	Justification / Comments
c) How effective is this document in incorporating the hazard controls into the appropriate work document?	1	3009-3.0, Step 1.4	
d) How well does this document apply the graded approach concept in the planning and preparation of work documents (i.e., is this document flexible in format and content based on the application)?	1	WM-10, 6.0	
e) How well are lessons-learned and feedback incorporated into the planning process?	0		
f) How well does the document address “skill-of-craft” principles into the development of the work documents?	1	3001, Attach. C 3005	Item # 17 definition.
g) How well does this document implement engineering design changes?	1	WM-10, Exhibit B, 6.12	
h) To what level is the worker involved?	0		
4) How effective is this work control document in the work performance?	1.7		
a) How effective is this document in material requisitioning and procurement?	2	3001-3.0, Step 1.9 3005-E.2.0 3004-E.2.1 WM-10, 6.3.5	BOM requirements reviewed during walkdown. Identifies all the players and steps. Coordinating parts supply and delivery.
b) How effective is this document in ensuring adequate work authorization (to include work document review, approval, and work release)?	2	3004-E.2 3005-4.1 3009-Step 1.4	Many reviews and much coordination. Steps 4.4, 4.8, 4.10 Shift authorization.
c) How effective is this document in work scheduling?	3	3005-E.2.0 3004-E.2.0, E.3.0	Attachment B gives cycle planning milestones. Very detailed, well coordinated.
d) How effective does this document address pre-job briefings?	1	3004-Attach B, C 3009- Step 1.6	Basic Checklists
e) How effective does this document address work execution instructions?	1	3009-3.0, Step 2.3 WM-10, 6.6, 6.11	

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SITE ANALYSIS – COMMERCIAL PLANT #2

Lines of Inquiry	Score	Procedure Locator	Justification / Comments
f) How effective and flexible is this document in addressing document revisions and field changes?	2	3009-Step 2.6, 2.7 WM-10-Exhibit A	Good guidance on making field revisions.
g) How effective is this document in addressing post-performance testing and acceptance?	1	3005-E.2.0, 3004- 3009-	Step 4.13 Step 5.17 Step 3.1 to 3.4
5) How effective is this work control document in soliciting feedback?	1.5		
a) How effective is this process in ensuring adequate close-out of the work documents?	1	3004-Step 5.15 3009, Attach A	Step in flow diagram.
b) How well does the document solicit/input feedback?	1	3004-E.2.6	Performance review week.
c) Does this document provide an avenue to obtaining feedback (e.g., does this process describe a post-job review approach)?	2	3004-E.2.6 3009-Step 2.12	Performance review week.
d) How flexible and user-friendly is this feedback system?	2	3004-4.6, Steps 6.6, 6.7	Attach F- Performance Analysis Review Meeting Checklist
6) How effective is the work control document in addressing the training and qualification requirements?	0.5		
a) How effective is the work control document in identifying job unique training and qualification requirements?	0		
b) How effective is the work control document in verifying that training and qualification requirements are verified prior to the start of work?	1	3004-Attach. C 3009-3.0, Step 1.3 WM-10, 6.11.4	Check box only. Work prerequisites. Verification requirements.
7) How adequately does the work control document address the roles and responsibilities for those personnel involved?	1.0	3001, 3004, 3005, 3006	Section 2.0 in all procedures list responsibilities. Each step in flow diagrams list the responsible person.
8) How well does the work control document address the balance of priorities with respect to safety implications and time?	1.0	3001-Attach C and G 3006-Attach C, D, E	Attach C is definitions. Attach G- Priority screen with a sequential flow. Expert based system. Attach C to E-Careful analysis for on-line work.

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SITE ANALYSIS – COMMERCIAL PLANT #2

GENERAL SITE QUESTIONS	
Question	Response
1) How adaptable is this document to other DOE Sites?	Partly adaptable for flow diagram and content. Every dependent on EMCS for work control documentation.
2) How broad of a spectrum does this document cover?	Maintenance only
a) Can this document be used for the following activities?	
• Corrective Maintenance	Yes
• Preventive Maintenance	Yes
• D&D	?
• Operations	No
• Construction	Yes for modifications only
• R&D	N/A
• Environmental Restoration/Remediation	No
• Other (i.e., Services, Surveillances, utilities, Service technicians, etc.) – Specify	Yes
• Services/Warranty Type Work	Yes
3) Does this work control document require the support of a CMMS? – Specify Software Used.	Heavy integration of computer steps in these procedures. Uses the Electronic Work Management System (EWMS) program.